FLIGHT
The AIRCRAFT ENGINEER & AIRSHIPS

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DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list—

1929.

May 23	Lecture, "Lubrication of Aircraft Engines," by F. A. Foord, before R.Ae.S. and Inst.Ae.E.
May 23-June 8	Royal Tournament, Olympia.
June 9.	Cambridge Air Meeting.
June 19-22	F.I.A. Conference, Copenhagen.
June 27-30	Rotterdam International Air Meeting.
July 5-6	King's Cup Race.
July 13	R.A.F. Display at Hendon.
July 16-27	7th International Aero Exhibition, Olympia.
July 25	Bleriot Cross-Channel Flight Anniversary Fete, Calais.
July 28	International Flying Meeting, Sweden.
Aug. 1-14	French Light Plane Meeting, Orly.
Aug. 15	International Balloon Race, Poland.
Sept. 6-7	Schneider Trophy Race, Solent.
Sept. 10-20	Aero Club de France Meeting, Le Baule.
Oct. 1	Gordon-Bennett Balloon Race, St. Louis, U.S.A.
Oct. 31	Guggenheim Safe-Aircraft Competition Closes.

EDITORIAL COMMENT

IN our Editorial Comment, last week, we expressed certain misgivings concerning the possible attitude of the Air Ministry in the matter of British aircraft constructors exhibiting at Olympia their latest types of service aircraft, pointing out that, unless the Air Ministry be willing to make concessions, machines might be kept out of Olympia which, in the interest of British prestige, should undoubtedly be shown.

We are very glad to learn, from the Society of British Aircraft Constructors, that the Air Ministry has shown itself most willing to assist in every way possible. There has, the S.B.A.C. communication states, been no question of red tape, and it is asserted that no British constructor will be precluded from exhibiting a machine which he wishes to exhibit. When the S.B.A.C. first decided to hold the exhibition, the Air Council, as was at the time announced, very kindly agreed to alter the date of the R.A.F. Display so as to bring it as close as possible to the date fixed for the opening of the exhibition. That this was a considerable concession on the part of the Air Council is without doubt, as it meant rearranging the training programme. It is equally satisfactory to learn that, throughout the discussions between the S.B.A.C. and the Air Ministry, the officials concerned showed that the official procedure possesses the requisite flexibility, and gave every evidence of a desire to assist in every way possible in making the exhibition a success.

Olympia

This all sounds most satisfactory, and we are unreservedly pleased to discover that our fears were, in this instance, rather unfounded. We formed our impression from correspondence and interviews with a number of aircraft firms, and as a result of being informed, in several instances, upon applying for material for descriptive articles dealing with show machines, to be published in the special show issues of FLIGHT, that, as the machines to be exhibited were still on the "Secret List," such facilities could not be granted. In more than one case we were given to understand that the machines in question

would, in all probability, not be placed on the " Part Publication " list until shortly before the R.A.F. Display. This, of course, is the usual routine procedure, and does not appear to give obvious evidence of the official procedure " possessing the requisite flexibility."

It would almost appear that, for once, the Air Ministry is not to blame, but rather that some constructors have become so accustomed to observing restrictions that, when the restrictions are removed in a special case, it " seems too good to be true."

Probably, no one will deny the advantages of good illustrated descriptive articles. That those of FLIGHT are held in rather high regard is proved by the fact that the American National Advisory Committee for Aeronautics reprints a very large number of FLIGHT's aircraft descriptions as Aircraft Circulars. On a special occasion like the Olympia Show it will be admitted that such articles are of very considerable publicity value. All the world and his wife cannot visit Olympia, obviously, and for the benefit of those thousands of FLIGHT readers overseas who are unable to go to Olympia, the illustrated descriptive articles are, as we have good cause to know, greatly appreciated. Not only so, but even visitors to Olympia may not, almost certainly will not, have the time or opportunity for as thorough an examination of every machine as might be desired. To those also, therefore, illustrated descriptive articles are extremely useful in supplementing by sketches, drawings and photographs the personal inspection of the machine itself.

One is forced to the conclusion that the technical aviation press, being a very necessary and essential part of the British aircraft industry, might, on a special occasion like this, have been invited to attend the discussions between the S.B.A.C. and the Air Ministry, or at least have been kept officially informed of the position. For the technical press to be able to do justice to the many new machines which, according to the communication from the S.B.A.C., will be permitted to be exhibited, it is necessary for representatives of that press to gather the material together well in advance. The fact that certain machines will " be taken off the Secret List " a few days before the opening of the show helps very little, and a clear statement to the effect that the Air Ministry has no objection to such machines as will be exhibited, even if they are at present on the Secret List, being made available for collecting data and sketches, etc., in advance, seems to be called for. If justice is to be done to our British constructors, this is definitely necessary, and, if the S.B.A.C. communication which we have received means anything at all, it means that the few firms which still remain " nervous " about placing information at our disposal are interpreting the Air Ministry regulations more strictly than even the Air Ministry itself intended. It might have been thought that someone, during the discussions between the Air Ministry and the S.B.A.C., would have had the bright idea of ascertaining the position of the technical press in relation to the " concessions " made in connection with Olympia and " secret " aircraft.

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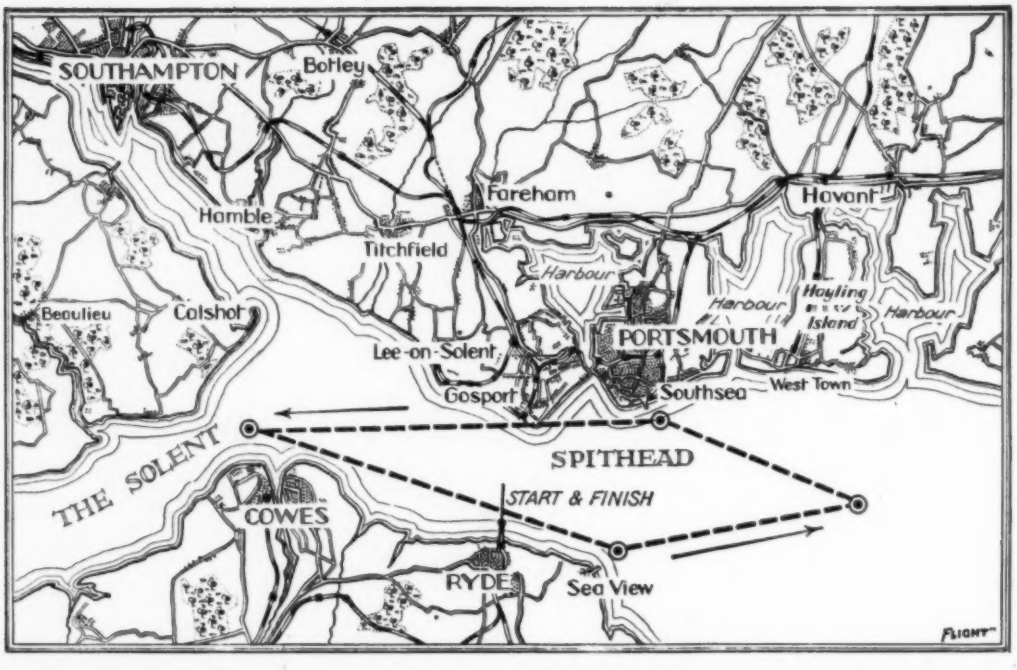
THE SCHNEIDER TROPHY COURSE



SCENE OF THE CONTEST: This sketch map, indicating approximately the course which the racing seaplanes will follow in the contest for the Schneider Trophy on September 7, should enable FLIGHT readers to choose their points from which to watch the race. Gosport and Southsea fronts will afford a splendid view, as will also the coast of the Isle of Wight from Cowes to Ryde and Seaview.

THE SUPERMARINE "SEAMEW"

An Amphibian with two Armstrong Siddeley "Lynx" Engines

THE Service version of the Supermarine "Seamew" Amphibian flying-boat is a reconnaissance three-seater with two Armstrong Siddeley "Lynx" engines, and it is this machine which is illustrated in the photographs. The following data, however, relate to the civil machine, which is very similar except for certain obvious changes such as the removal of machine guns and other military equipment.

The "Seamew" is a typical Supermarine craft, and bears a strong family resemblance to the famous "Southampton," a type which has "made history" by many famous flights, as well as by its excellent work in the service. The "Seamew" is, however, considerably smaller, and its power-plant consists of two Armstrong Siddeley geared "Lynx" engines. The employment of reduction gearing has resulted in a considerably increased performance, more especially in the matter of taking off, when the extra propeller efficiency obtained with geared engines reduces the run. The climb also is improved.

The civil version of the "Seamew" is designed either for passenger or freight carrying, and in the former case there is accommodation for six passengers and a crew of one, the pilot.

The civil "Seamew" is of composite construction in that the wings and tail unit are of wood, while the boat hull and wing tip floats are of metal (Duralumin). The biplane wings are slightly swept back, and as in other Supermarine flying boats the monoplane tail is carried on a raised stern, well clear of the water. There are two rudders, each preceded by a vertical fin, working wholly above the one-piece elevator. The tail plane is braced to the stern of the hull by struts.

The amphibian gear consists of two wheels mounted on a structure of steel tubes in such a manner that they can be raised clear of the water when the machine is afloat. Apart from its main function of a land undercarriage, the wheel chassis is also extremely useful in enabling the machine to alight near a beach and then, when the wheels have been lowered, taxy ashore under its own power without the fuss entailed in fitting a beaching trolley. The land under-carriage gear weighs some 200 lbs., or the equivalent of rather more than one paying passenger, so that for use over districts where the amphibian qualities are not essential, the machine can either carry the extra passenger, or the load made available may be in the form of fuel, thus extending the cruising range.

The "Lynx" engines are mounted between the wings in the normal manner and drive tractor airscrews. The fuel tank is mounted in the top plane, on the centre line, a position which gives direct gravity feed to the engines.

The main dimensions of the civil "Seamew" are as follows: Length overall, 37 ft.; wing span, 46 ft.; wing area, 610 sq. ft.

The tare weight is 3,560 lbs., and the permissible total gross weight 6,500 lbs. The disposable load, of 2,940 lbs., is composed as follows:—

Crew (1)	180	lbs.
Passengers (6)	900	,,
Baggage and cargo	415	,,
W/T	150	,,
Electrical equipment	50	,,
Instruments	40	,,
Marine gear	40	,,
Petrol (135 gallons)	1,025	lbs.
Oil (14 gallons)	140	,,
Total load carried	2,940	lbs.

THE SUPERMARINE "SEAMEW": Two views of the Service Version.

Power loading on full power, 13·4 lb./h.p.; power loading, on normal power, 14·15 lb./h.p.; wing loading, 10·65 lb./sq. ft.

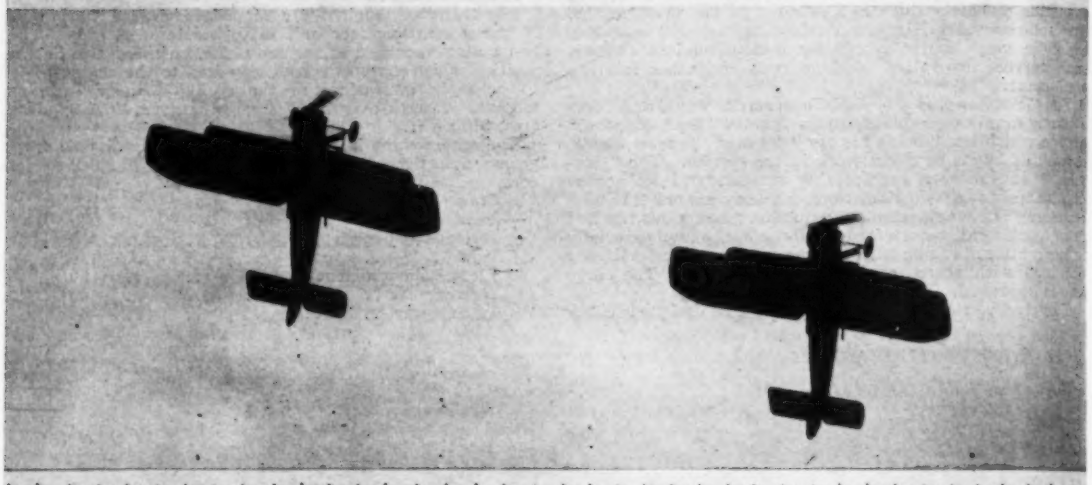
Performance

No detailed performance figures are available, but the maximum speed of the civil "Seamew" is about 101 m.p.h., and the stalling speed 52 m.p.h. The rate of climb at sea level is 540 ft./min.

With the quantity of fuel given (135 gallons), the range at cruising speed is about 300 miles. As already mentioned, if the land undercarriage is discarded, the useful load can be increased by 200 lbs., and if this is devoted to fuel and oil the range will be correspondingly increased.

The Supermarine "Seamew" should be a very useful type for routes where there is not enough traffic to warrant the employment of a larger machine. As a private owner's "air yacht," the type has much to recommend it.

R.A.F.



AEROBATIC COMPETITION

["FLIGHT" *Photograph*

Armstrong Whitworth "Siskins" ("Jaguars") of No. 29 (Fighter) Squadron zooming.

Eliminating Contest Among Fighter Squadrons
R.A.F. Pilots Selected for R.A.F. Display

AT the R.A.F. Station at Northolt a competition between selected pilots of R.A.F. Fighter Squadrons was held on May 16 to decide who should perform at the Tenth Royal Air Force Display at Hendon which takes place on July 13.

The Judges were Air Vice-Marshal F. R. Scarlett, C.B., D.S.O., Air Officer Commanding the Fighting Area of the Air Defence Command, Air Vice-Marshal Sir E. L. Ellington, K.C.B., C.M.G., C.B.E., p.s.c., Air Officer Commanding-in-Chief, Air Defence of Great Britain, Group-Capt. P. L. W. Herbert, C.M.G., C.B.E., Wing Commander K. R. Park, M.C., D.F.C., p.s.a., and Sqdn.-Ldr. A. T. William, O.B.E., p.s.a. The issued programme gave the following pilots, machines and squadrons in the competition:—

(Fighter) Squadrons.	Pilots.	Machines and Engines.
No. 1	F/O T. B. Byrne ..	Armstrong-Whitworth "Siskins IIIA" (Jaguar).
	F/O P. F. Luxton..	" " "
No. 29	F/O J. Clarke ..	" " "
	Sgt. Morton	" " "
No. 41	Flt.-Lt. F. K. Damant	" " "
	F/O T. J. Arbuthnot	" " "
No. 56	F/O L. R. Stokes ..	" " "
	F/O R. K. Hamblin	" " "
No. 111	F/O J. W. Gillan ..	" " "
	P/O F. Whittle ..	" " "
No. 17	F/O P. M. Watt ..	" " "
	Sgt. Burch	" " "
No. 19	F/O J. W. Bayes ..	" " "
	Sgt. Parsons	" " "
No. 32	Flt.-Lt. J. N. Boothman	" " "
	F/O H. W. Charnock	" " "
No. 43	F/O L. W. Howard	" " "
	P/O H. H. Leech ..	" " "
No. 3	F/O E. S. Finch ..	Gloster "Gamecocks" (Jupiter).
	F/O J. E. Jorgensen	" " "
No. 23	F/O C. H. Jones ..	Gloster "Gamecocks" (Jupiter).
	F/O H. A. Purvis ..	" " "
No. 25	F/O R. J. A. Ford..	Gloster "Grebe" (Jaguar).
	Sgt. Bicknell	" " "

Note.—Some of the engines were supercharged.

Set and Voluntary Evolutions

The programme of evolutions was carried out by the pilots in pairs. It was divided into seven minutes of set evolutions to be carried through in seven minutes, followed by three minutes of voluntary evolutions which had to include inverted flying. Details of the set programme were as follows (though not necessarily taken in this order):—

(1) Loop carried out by No. 1 aeroplane flying towards the Judges, and simultaneously by No. 2 machine flying at an angle of 60° from No. 1's course.

(2) Zoom followed by a Flick Loop, carried out by No. 1 flying away from the Judges, and by No. 2 on a directly opposite course to the previous evolution.

(3) Slow Roll by No. 1 flying parallel to the Judges, and by No. 2 flying at right angles to the former's course and away from the Judges.

(4) Upward Roll, carried out in the same direction as the Slow Roll.

(5) Stall Turn after a Zoom in the same direction as the Loop.

(6) Half Roll off Top of Loop in the same direction as the Zoom, followed by the Flick Loop.

(7) Half Roll, followed by a Loop in the same direction as the Slow Roll.

A maximum of 100 marks could be obtained, made up of 10 marks for each of the standard evolutions and 30 marks for the voluntary evolutions. In particular, marks were deducted for evolutions carried out in such a position that the Judges could not see the manœuvres in comfort. The Judges, of course, assumed themselves spectators at the Hendon Pageant, so that they might judge how the *real* spectators will see the Display.

The machines were standard and fully equipped except for ammunition, bomb racks, camera guns, accumulators and oxygen cylinders.

["FLIGHT" *Photograph*

R.A.F. (Fighter) Squadrons awaiting their turn for competition at Northolt to decide which Squadron should be selected for performing at the R.A.F. Display.

The Competition

The standard of flying was mainly very good, but although it reached its highest in the performances of the winners and runners-up, the winning pair were outstanding. They were F/O C. H. Jones and F/O H. A. Purvis of No. 23 (Fighter) Squadron, Kenley, Surrey, who flew Gloster "Gamecocks" (Bristol "Jupiters"). This pair have given previous air displays, and one recalls a good show of theirs in the vile weather at Hooton Aerodrome, Cheshire, during the air meeting of September 24 in 1927. Flying-Officer Purvis is an ex-Cranwell Cadet. If the flying of these two is as good at the coming R.A.F. display as it was last Thursday the standard of previous years will at the least be well maintained.

Their flying at Northolt had a smoothness, precision and symmetry which were almost perfect. These characteristics are the symbols of the skilful modern pilot as opposed to the rough, sling-it-about methods of the old pilot. It is not sufficient for Royal Air Force standards to be able to perform the entire repertoire of manœuvres. It must be performed with an artistic touch on the controls and described in perfect patterns. There should be no rough edges to the patterns.

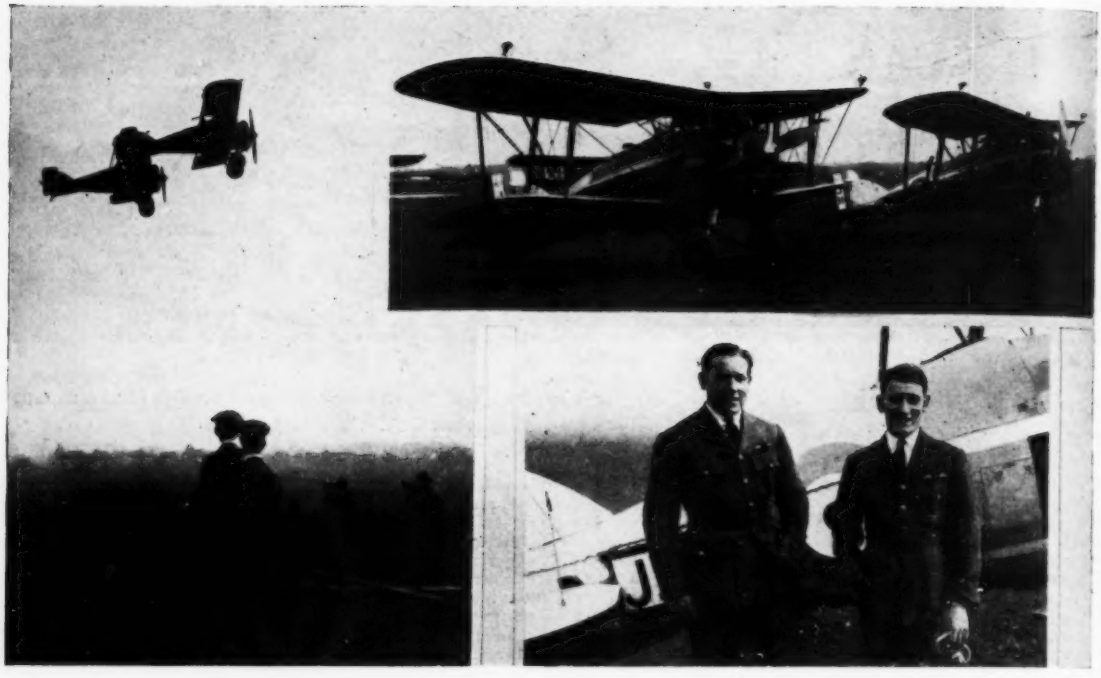
Just the fault of a little roughness would seem to have put the runners-up, Flying-Officer J. Clarke and Sergt. Morton, into their secondary position, but they appeared to be leading until the winning pair rose to a higher standard. Incidentally, Flying-Officer Clarke has a remarkable intellectual and practical record in the R.A.F.

Unofficially, he was fancied as the winner before the programme had started. He has won numerous important prizes and risen from the ranks. He passed through Cranwell as a cadet. He and his partner Sergt. Morton, will continue in training until the R.A.F. Display is given and act as reserves.

The third winning pair were Flight-Lieut. J. N. Boothman and Flying-Officer H. W. Charnock of No. 32 (Fighter) Squadron stationed at Kenley, Surrey.

["FLIGHT" *Photograph*

THE JUDGES: (Right to Left). Air Vice-Marshal Sir Edward L. Ellington, Air Vice-Marshal F. R. Scarlett, Group-Capt. P. L. W. Herbert, Wing-Commander K. R. Park and Sqdn.-Ldr. A. T. William.



["FLIGHT" *Photographs*

WINNING PILOTS AND MACHINES OF R.A.F. FIGHTER COMPETITION:
***(Right to Left)* F/O C. H. Jones and F/O H. A. Purvis of No. 23 (Fighter) Squadron who won on the Gloster "Gamecocks" (Jupiters) seen in flight and stationary.**

This is the table of winners with other details :—

(Fighter)	Squadrons	Pilots	Machines and Engines
1st	No. 23	F/O C. H. Jones	Gloster "Gamecock" ("Jupiter")
		F/O H. A. Purvis	" "
2nd	No. 29	F/O J. Clarke	Armstrong Whitworth "Siskin IIIa" (Jaguar).
		Sergt. T. Morton	" "
3rd	No. 32	Flt. Lt. J. N. Boothman	" "
		F/O H. W. Charnock	" "

These winning pilots were lined up before the judges at the end of the competition and briefly complimented by Air Vice-Marshal Sir Edward Ellington, who reminded them that it was the accurate "placing" of their manœuvres for the advantage of the spectators which was so important.

One competing pilot, Flying-Officer J. W. Bayes, aged 24, of No. 19 (Fighter) Squadron, Duxford, unfortunately crashed after righting himself from a very low roll and was killed. He was appointed to his squadron last December. The programme was continued after a pause in accordance with the Royal Air Force traditions, and there was no other mishap.

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SIDDELEY TROPHY TOUR

THE Siddeley Trophy Tour for the Challenge Cup presented by Mr. J. D. Siddeley will take the form of a handicap race to be run simultaneously with the King's Cup Race and over the same course. (Particulars of the course were detailed in FLIGHT, May 2.) Light aeroplanes may take part in both events.

The race will commence on July 5 and finish on July 6 at 10 p.m., the venue being Heston Aerodrome, Hounslow, London.

Light 'plane clubs may enter any number of competitors. The machines must belong to the club or a member, and the pilot must be a member. Paid instructors are excluded. In the case of privately-owned aircraft the owner must be the pilot, and be a British subject. Weight empty of the machines (which means the total weight in flying order, fuel and crew not included) must not exceed 1,000 lb. Water in radiators will count in the weight empty. Machines and engines must be entirely constructed in the British Empire. An entry fee of £5 with entry form must be sent to the Royal Aero Club not later than 5 p.m., June 7. Late entries (with a fee of £10) can be sent up till noon, June 14. If the machine is entered for the King's Cup too, no further fee is necessary, but the entry form must be filled up by the club entering. The prizes are: Challenge Trophy, presented by Mr. J. D. Siddeley; and £100, presented by Mr. A. S. Butler.

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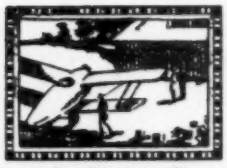
Flt.-Lt. E. R. C. Scholefield

WE regret to report that the well-known test pilot for Vickers Ltd., Flight Lieutenant E. R. C. Scholefield, was killed on May 16 whilst testing a Vickers "Vanguard" from Brooklands. With him was Mr. S. W. Sherratt, who was also killed. Flight-Lieutenant Scholefield originally joined the Royal Flying Corps at the outbreak of war as an airman, but subsequently was given commissioned rank, and in the middle of 1915, while on patrol over the lines on the Western Front, was shot down by an enemy machine. He was taken prisoner, and spent the rest of the War in Germany. During the War he won the Distinguished Conduct Medal, and after the war he became one of the experimental test pilots at the Royal Aircraft Establishment, Farnborough, where he carried out important research work in the air. From there he joined the staff of Vickers Ltd. as chief test pilot.

Light Plane Accident.

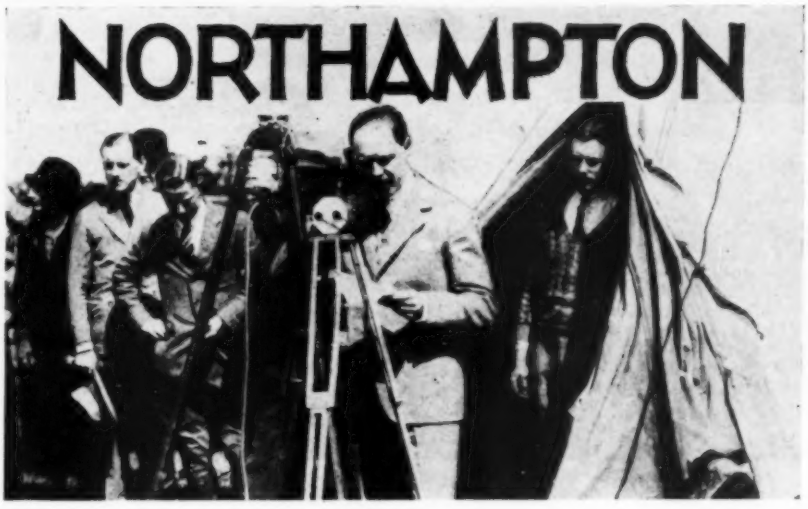
MR. HILBERT HAMER and Mr. Leonard Butler, officials of the Irving Air Chute Company of Great Britain, Limited, Letchworth, were practising manœuvres on Saturday for a forthcoming display when their machine crashed at Odsey, Cambridgeshire, and both were killed.

PRIVATE FLYING



A Section of FLIGHT in the Interests of the Private Owner, Owner-Pilot, and Club Member

THE WHITSUN MEETINGS



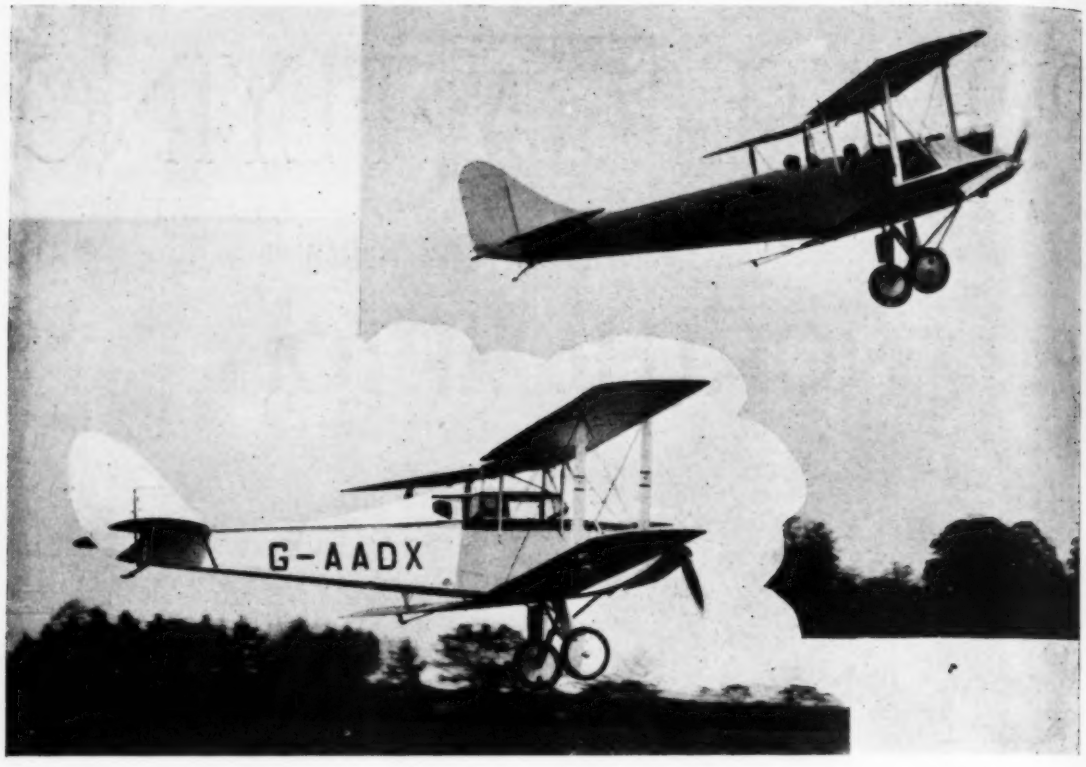
["FLIGHT" *Photograph*

The Rt. Hon. Earl Spencer speaking into the microphone on declaring the Northampton Air Pageant open on Whit Monday.

ALTHOUGH one of the youngest flying clubs in the country, the Northamptonshire Aero Club has an enviable faculty for organising good Air Pageants and attracting excellent support from all the necessary directions. The Whitsun meeting at Sywell was a worthy successor to the club's first meeting last September, which quite surprised everyone by its scope in the circumstances, for then the club was but in the embryo stage. It was the sort of meeting

["FLIGHT" *Photographs*

PENALTY OF FAME : The Hon. Lady Bailey at the mercy of the film operator at Sywell Aerodrome. (Right) Mr. A. S. Butler who flew his new Coupé Gipsy Moth at the Northampton meeting. Its colours are black and green.

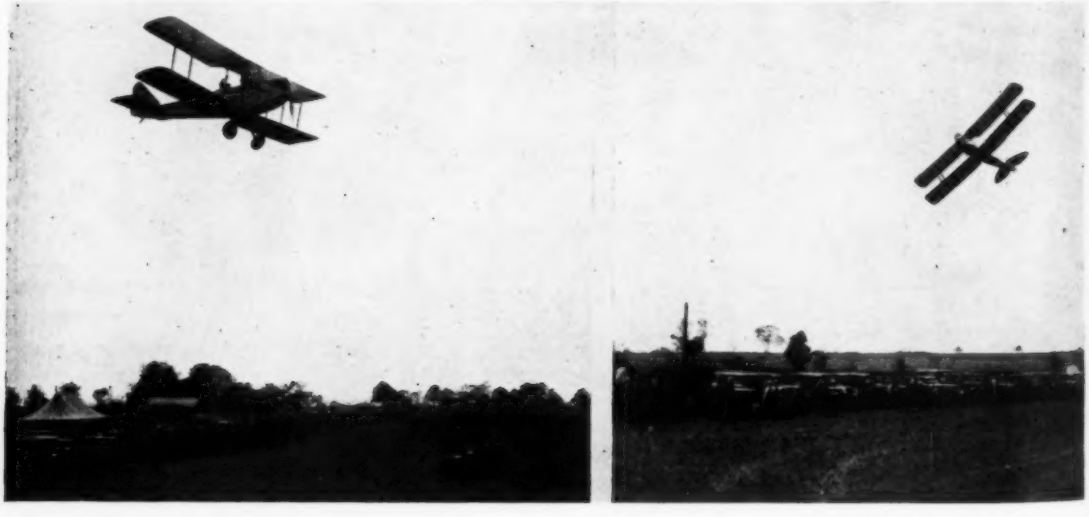


["FLIGHT" *Photographs*

(Below) Mr. A. C. M. Jackaman competing with his familiar Coupé Gipsy-Moth "Peridot III" in the Landing Competition. (Above) Mr. Dobson's all-metal Avro "Avian" in the machine parade.

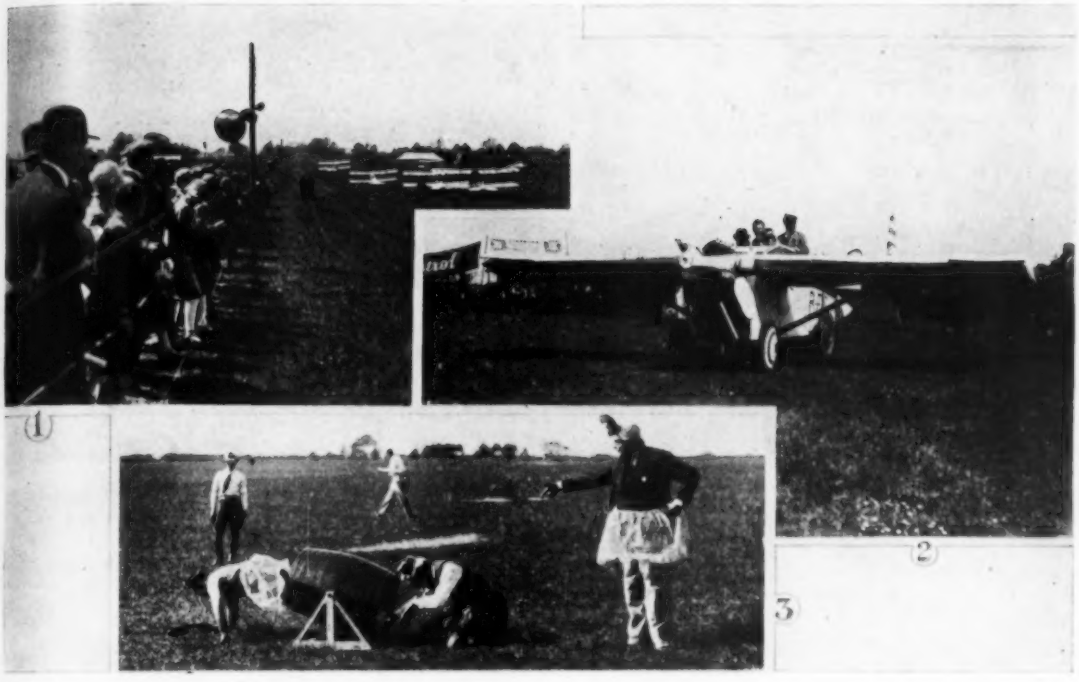
that everyone who attended did not forget, which explains the same success which marked this Whitsun Meeting. In the meantime the club has developed, as quite anticipated. On Sywell Aerodrome a good club-house has arisen, two machines are possessed by the club, and an experienced pilot instructor and first-class ground engineer are busy turning out pupils. Actual flying instruction only commenced on March 4 last, but by the end of April the club machine had flown over 68 hours., and 18 pupils had received instruction.

The Rt. Hon. The Earl Spencer is the President of the club, whilst Vice-Presidents include Lord Bray, Lord Erskine, Sir Charles Wakefield, and Col. L'Estrange Malone, M.P. Mr. C. M. Newton is the chairman, and Mr. W. Harris the Managing Director. Mr. P. G. Hayward is Secretary, and Flying Officer James Bunning the Chief Instructor. From the beginning of its existence, the club has always had private owner-pilots amongst its members, in the persons of Mr. G. and Mr. A. J. Linnell. Their names were among the original



["FLIGHT" *Photographs*

Capt. Neville Stack (Right) in a familiar attitude in the A.D.C. Co's "Cirrus-Moth" at Sywell Aerodrome. (Left) Mr. Cantrill, in the Avro "Avian," bombing the Austin "Baby."



["FLIGHT" *Photographs*

(1) Parade of Machines along the thickly-populated spectators at Northampton Air Pageant. (2) "The Sywell Mayfly" in the parade flown by Mr. "Titus Canby." (3) "Orrible" Obstacle Race.

lists of private owners in FLIGHT columns. The club's first lady pupils were Miss Hylda Keers and Miss Maureen Harris, whilst the club's first soloist was Mr. P. Tyzack, who is on the committee.

Flying charges are as follows:—Instruction, £2 per hour; solo flying, 30*s*. per hour; and joy rides cost 5*s*. and 10*s*. Membership subscription for associate members is one guinea, and for flying members three guineas.

The Whitsun Programme

Glorious weather favoured the Sywell Aerodrome on Whitsun Monday, and a crowd, estimated at 35,000 people, was present. All the usual private-owner pilots and commercial pilots seemed to be there, about 40 machines being on the ground. Earl Spencer performed the opening ceremony. The morning's event was a taking-off and landing competition for private owners and club members flying club machines. The prize was a silver cup, presented by Mr. W. Harris, and £10. This event was won by Mr. A. C. M. Jackaman on his Coupé Gipsy-Moth.

There were various demonstrations of flying by well-known pilots. Mr. H. Penrose, of the Westland Aircraft Co., Ltd., gave his usual efficient display on a Westland "Widgeon" monoplane. Mr. Byron, of the same company, unfortunately crashed whilst giving a similar display, but was uninjured.

Mr. G. E. Lowdell, chief instructor of the Suffolk and Eastern Counties Aeroplane Club, performed on the Blackburn "Lincock" (Lynx) light fighter, which he has quickly become expert upon. Capt. N. Stack, the test pilot, also stunted on the Cirrus-Moth "UF" with that dash charac-

Mr. H. Penrose, of the Westland Aircraft Co. Ltd., demonstrating the Westland "Widgeon" monoplane above a thick row of spectators and cars at the Northampton meeting.

"FLIGHT" *Photograph*

"FLIGHT" *Photograph*

Visiting machines at Northampton on Whit Monday. This was the Club's second successful Pageant.

teristic of his performances. On a Gipsy-Moth, Capt. H. Broad gave a good exhibition, particularly with low loops.

Flt-Lt. J. Armour did upside down flying on a Gipsy-Moth.

Other events in a very complete programme included a parachute descent by Mr. J. Tranum, with a Russell parachute, balloon bursting, a parade of types of machines, and an "'Orrible Obstacle Race."

The latter event was very amusing. Competing pilots ran a few yards, raced in sacks a short distance, threw on odd clothing, crawled through a barrel, drank a bottle of beer, rode donkeys, raced to their machines in cars, and flew a course.

Flight-Lieut. Le Poer Trench, on the Halton monoplane, was the winner of the first heat, and Mr. A. C. M. Jackaman winner of the second heat on his Coupé Gipsy-Moth.

In the parade of types of machines, there was a comic contraption called "The Sywell Mayfly," piloted by Mr. "Titus Canby," and navigated by the eminent Chinese navigator, Mr. "Warethee L. Arwee." It used a novel "fuel," and the pilot was included in the "fuelling system." There were slots on the wings with elastic attachments. This machine was the most ingenious we have seen amongst ideas for comic relief.

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Norwich

["FLIGHT" *Photograph*

FAIR summery weather graced the "Grand Aerial Display" which was held by the Norfolk and Norwich Aero Club at Mousehold Aerodrome, both on the Sunday and Monday. While the Norfolk meeting was not, perhaps, such a large affair as the one, just described, at Northampton, it was none the less a very enjoyable affair, and a good programme was arranged and got through without mishap. The attendance was not as big as it might have been, but no doubt the Northampton affair "bagged" some of the gate—for, in spite of the improved and speedy facilities of transport afforded by aircraft, it is still somewhat difficult to be in two places at once! As a matter of fact, we believe some people did "do" the two meetings, including our energetic Director of Civil Aviation, Sir Sefton Brancker, who flew over from Mousehold Aerodrome to Northampton in his D.H. "Moth."

Actually, the Norfolk meeting opened on Whit-Sunday at 3 p.m., but that day's events were confined to such minor items as Balloon Bursting (for a silver cup presented by Messrs. C. C. Wakefield, Ltd.), Aerial Golf (1st prize, a "Moth" car mascot presented by the De Havilland Aircraft Co., Ltd.), and "Joy-riding."

As regards the latter, many passengers were taken up, not only in the Norfolk Club's own light 'planes, but also by Sir Alan Cobham in his D.H. "Giant Moth" (D.H. 61, with Armstrong Siddeley "Jaguar"), the "Youth of Britain."

On the Monday the proceedings opened with an inspection of aircraft by the High Sheriff of Norfolk, Stanley Christopherson, Esq., J.P., accompanied by the Lord Mayor of Norwich, H. P. Gowen, Esq., J.P. After the inspection the machines took part in a "fly past" and then, on landing, proceeded to the aeroplane park beyond the club hangar. Of the machines present at this display there was quite a varied assortment, from the small Kelmon (40 h.p. Salmson) monoplane to the slightly larger Beardmore "Inflexible," which

["FLIGHT" *Photographs*

NORWICH AIR DISPLAY: Variety in types of aircraft, from both ends of the scale. Top, the Beardmore "Inflexible" monoplane of 1950 h.p. Centre: the Boulton & Paul "Sidestrand" (two Bristol "Jupiters"), and below, the Klemm (40-h.p. Salmson) light monoplane.

["FLIGHT" *Photograph*

"AIRMINDEDNESS" AT NORWICH: Sir Alan Cobham was busy, both on Sunday and Monday, taking up passengers in the D.H. "Giant Moth" (D.H. 61, Siddeley "Jaguar").

is fitted with three 650 h.p. Rolls-Royce "Condors." The Service was represented by a couple of Handley Page "Hyderabads" and a "Genet-Moth." During the proceedings a Simmonds "Spartan" light 'plane—we are not certain about the pilot—paid a hurried visit, while the Blackburn "Lincock" (Armstrong Siddeley "Lynx"), piloted by G. E. Lowdell, Instructor to the Suffolk Club, also put in an appearance, although he was also functioning at Northampton. Incidentally, he was down on the programme for an exhibition of aerobatics on this machine, but his "turn" was deputised by F/O Summers on a "Moth."

At noon a cross-country handicap race, from the aerodrome to Ranworth Church, Wroxham, and back, was flown. This was followed by the exhibition mentioned above; then, during the lunch interval, more passengers were taken up in the club machines and by Sir Alan—the Lord Mayor of Norwich and Sir Sefton Brancker being amongst the passengers. Capt. Wilson, the *Daily Mail* pilot, also gave a demonstration of bombing a car from a "Moth."

The next event was a delayed parachute descent by Mr. J. Tranum, with a Russell Lobe; it was quite a good drop, and produced quite a thrill amongst the spectators. After this the Beardmore "Inflexible" made a demonstration flight, and really looked very impressive after one's eyes had become focussed for all the smaller fry that had been flying up to now.

["FLIGHT" *Photograph*

THE D.C.A. AT NORWICH: Sir Sefton Brancker alighting from the D.H. "Giant Moth" after a flight with Sir Alan Cobham.

Then Sir Alan Cobham gave the spectators a short "talk" with the help of loud speakers, during which he explained the object of his tour and visit to Norwich in connection with his scheme for establishing municipal aerodromes. A little fun was next provided by means of an obstacle race, in which competitors had to pass through the obstacle course, don flying kit and take off in their machines, make a complete circuit of the aerodrome and finish over the line.

Two interesting demonstrations followed—some "crazy" flying by F/O Summers, and some aerobatics by Sqdn.-Ldr. C. Rea—at least we think this was the pilot—on the Boulton and Paul "Sidestrand" twin-engined bomber (Bristol "Jupiturs"). This was a very fine demonstration, and the pilot looped, stalled and otherwise threw the machine about in a manner, considering it was a fairly big twin-engined 'bus, wonderful to behold.

The proceedings were brought to a close with a "set piece," based on the recent disturbances in Afghanistan.

["FLIGHT" *Photograph*

"BOMBING A SLIGHTLY BIGGER BABY": Capt. Wilson, the "Daily Mail" pilot, gave a demonstration at Norwich of bombing a car—in this case an Alvis.

LIGHT 'PLANE CLUBS

London Aeroplane Club, Stag Lane, Edgware, Sec., H. E. Perrin, 3, Clifford Street, London, W.1.
Bristol and Wessex Aeroplane Club, Filton, Gloucester. Secretary, Major G. S. Cooper, The Aerodrome, Patchway, Glos.
Cinque Ports Flying Club, Lympne, Hythe. Hon. Secretary, R. Dallas Brett, 114, High Street, Hythe, Kent.
Hampshire Aero Club, Hamble, Southampton. Secretary, H. J. Harrington, Hamble, Southampton.
Lancashire Aero Club, Woodford, Lancs. Secretary, Mr. Atherton, Avro Aerodrome, Woodford.
Liverpool and District Aero Club, Hooton, Cheshire. Hon. Secretary, Capt. Ellis, Hooton Aerodrome.
Midland Aero Club, Castle Bromwich, Birmingham. Secretary, Maj. Gilbert Dennison, 22, Villa Road, Handsworth, Birmingham.
Newcastle-on-Tyne Aero Club, Cramlington, Northumberland. Secretary, John Bell, Cramlington Aerodrome, Northumberland.
Norfolk and Norwich Aero Club, Mousehold, Norwich. Secretary, G. McEwen, The Aerodrome, Mousehold, Norwich.
Nottingham Aero Club, Hucknall, Nottingham. Hon. Secretary, Cecil R. Sands, A.C.A., 30, Park Row, Nottingham.
The Scottish Flying Club, 101, St. Vincent Street, Glasgow. Secretary, George Baldwin, Moorpark Aerodrome, Renfrew.
Southern Aero Club, Shoreham, Sussex. Secretary, Miss N. B. Birkett, Shoreham Aerodrome, Sussex.
Suffolk Aeroplane Club, Ipswich. Secretary, Maj. P. L. Holmes, The Aerodrome, Hadleigh, Suffolk.
Yorkshire Aeroplane Club, Sherburn-in-Elmet, Yorks. Secretary, Lieut.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.

LONDON AEROPLANE CLUB

(MAY 13–19).—Instructors: Flight-Lieut. H. G. Travers and Capt. F. R. Matthews. Ground engineers: C. Humphreys and A. E. Mitchell.

Aircraft.—The following machines were in commission:—G-AABN, G-AABL, G-AAEX, G-EBXS and E-EBZC.

Total flying time for the week: 96 hrs. Dual instruction: 32 members received dual instruction, the time being 33 hrs. 40 mins. Solo flying: 45 members flew solo during the week, the time being 62 hrs. 20 mins.

"A" licences.—The following members passed the necessary tests for their Aviators' certificates and "A" licences. —G. R. S. Charles, H. R. Presland, I. M. Symmons, J. A. Crane, L. Rowson.

Club House Fund.—The following donation has been received:—L. Rowson, £2.

Passenger carrying:—The following members have been granted permission to carry passengers: K. V. Wright, A. G. Store, J. C. V. K. Watson, C. J. E. Howard, C. W. G. Wood, H. M. Samuelson.

BRISTOL & WESSEX AEROPLANE CLUB, LTD.

(MAY 12–18).—Pilot instructor, : E. W. B. Bartlett. Ground engineer: A. W. Webb. Machines in commission: (2), TV, YH. Flying time for the week: 48 hrs. 30 mins. Pupils instructed: (17), 21 hrs. 40 mins. Soloists instructed: (7), 11 hrs. 35 mins. Licensed pilots: (6), 14 hrs. 5 mins. Test flights: (11), 1 hr. 20 mins. Passengers carried: (13), 10 hrs. 10 mins.

Two club records were broken this week, the total hours for the week, and that with only five flying days, and a single day's flying hours with 13 hrs. 35 mins., including three "A" licences, on which we congratulate Miss Pellier, Mr. F. Seymour-Williams and Mr. C. M. Lee. Mr. Farwell also passed his "A" the following day. Mr. Culverwell took Mr. Harford to Croydon, and on his return journey visited Dorset and Devonshire. Our members are increasing steadily in numbers, 17 having joined already this month. We hope the competitors for the Desprez Challenge Cup on the 26th will arrive about noon, and be the guests of the club at a light lunch in the club house.

CINQUE PORTS FLYING CLUB

(MAY 5–11).—Total hours for week: 16 hrs. 40 mins. Dual: Mr. Ellis, 3 hrs. 30 mins.; Mr. Lillingston, 1 hr.; Mr. Cox, 1 hr.; Mr. Reid, 1 hr. 30 mins.; Mr. Richardson, 3 hrs. 15 mins.; Mr. Bilham, 1 hr. 30 mins.; Mr. Mackinnon, 10 mins.; Mr. Wright, 30 mins.; Mr. Whittingham, 1 hr. Mr. R. Dallas Brett, 15 mins.; Mr. Hume, 45 mins. Total: 11 members, 14 hrs. 25 mins. "A" pilots: Mr. Mackinnon, 5 mins.; Mr. M. Braddell, 1 hr. Total: 2 members, 1 hr. 5 mins. Joyride: (1), 10 mins. Tests: (4), 30 mins.

Weather stopped flying on Sunday and Monday of this week, so that the flying time is very satisfactory for one machine for four days' flying.

Messrs. Cox and Reid, two new members from Wye College, commenced instruction this week.

Eight more new flying members were elected at a Committee Meeting during the week, making 31 new flying members, and one new ground member who has joined the Club since Easter. This is all very encouraging.

Members are reminded that the draw for the sweepstake for the seat in the machine which will go to the Rotterdam Meeting, will take place on Sunday, 26th instant, at Lympne, and they should apply for tickets, 5*s*. each, to the Steward or the Hon. Secretary as early as possible.

(MAY 5–11.)—The club has purchased a Mark (II) Cirrus Moth machine from the Brooklands School of Flying, Ltd. The machine was formerly the property of Mr. Wallace, and is numbered G-EBPM, and is painted grey, with gold letters and nose, and the back of the fuselage in blue and white squares, which gives it a slightly dissipated appearance.

Capt. Jones and Major Pickthorne came down in two Moths on Sunday, and ran into very thick weather near Lympne. Major Pickthorne succeeded in finding the aerodrome, but Capt. Jones landed near the Folkestone Race Course, afterwards proceeding to Lympne, when the weather cleared.

Owing to the holidays, no detailed report will be issued until the end of next week.

HAMPSHIRE AEROPLANE CLUB

(MAY 11–17).—Pilot instructors: Flight-Lieut. F. A. Swoffer, M.B.E., and Mr. W. H. Dudley. Ground engineers: Mr. E. Lenny and Mr. J. Elliott. Aircraft: D.H. 60 "Moth" G-EBOH, "Avian" G-EBVI and "Spartan" G-AAFR. Flying time for the week: 41 hrs. Pupils under instruction: (30), 21 hrs. 30 mins. Soloists: (4), 5 hrs. 20 mins. "A" pilots: (8), 4 hrs. 5 mins. Passengers: (12), 5 hrs. 30 mins. Instructors, solo and tests: (14), 4 hrs. 35 mins.

We are glad to report increased flying hours this week, with the improvement in the weather. Mr. Fleming went solo on the "Spartan" after less than 4 hrs. dual instruction.

On Thursday, Mr. Dudley, with Capt. Duke as passenger, took OH to Penzance, visiting Yeovil on the way. Their return journey against the wind was non-stop and took just 3 hrs.

Owing to Mr. Kerr Bayly taking off in the "Spartan" through a wire fence on Wednesday, FR had to be towed back from Bournemouth with a badly damaged wing. Messrs. Simmonds Aircraft have given us an indication of the value of interchangeability by replacing the damaged wing with a new one and getting the aircraft serviceable again within a couple of days.

We still need over £150 before we can purchase another aeroplane, and we hope that members will continue to be generous and assist us to raise this sum.

LANCASHIRE AERO CLUB

(MAY 5–11).—Flying time: 31 hrs. 15 mins. Instruction (12): 9 hrs. 25 mins. Solo flights (24): 13 hrs. 5 mins. Passenger (19): 6 hrs. 35 mins. Tests (13): 2 hrs. 10 mins.

Instruction (with Mr. Hall): Maxwell, Lister, Hindley, Crosthwaite, Stern, Greg, Foote, Barlow, Ashworth W., Ashworth, J. H., Wilkinson, Dane.

Machines in commission: QL, EC, MQ, XD.

Soloists (under instruction): Williamson, Goss, Maxwell, Barlow, Ashworth, W., Stern.

Pilots: Davies, R. G., Gort, Meads, Tweedale, Nelson, D., Michelson. Lacayo, Crosthwaite, Garner, Hall, R. F., Whitehouse, Mills, Kay, Twemlow, Goodfellow, Hardy, Weale, Gerrard.

Passengers (with Mr. Gort): Melville, Miss Bourne, Turner. (With Mr. Hall, R. F.): Garner, Miss Shaw. (With Mr. Mills): Miss Schuster, Tyas, Cliffe. Dickenson, Stranger. (With Mr. Michelson): Peters. (With Mr. Williams): Sandbach, Clutton. (With Mr. Green): Ebden. (With Mr. Meads): Hall, R. F. (With Mr. Lacayo): Worthington, Beenken, Whitehouse, Kay.

Mr. Maxwell was successfully launched on his first Solo, and Messrs. Barlow and Stern accomplished their height tests. The last-named has now completed all tests for his "A" licence.

EC went very near to repeating XD's performance last week. Fortunately she stopped on her nose and did not go over on her back. On rough ground and in gusty weather the new Mark IV undercarriage seems a bit too soft and the machines are apt to wallow badly on the ground. We are experimenting with extra compression rings in the undercarriage to try and cure this trouble.

On Friday we were visited by Mr. Birkett from the Air Ministry, who inspected Log Books, etc., and had a flight with Mr. Hall. Flight-Lieut. Richardson has also been a visitor with his Moth.

THE NORTHAMPTONSHIRE AERO CLUB

(MAY 5–11.)—Instructor: James Bunning. Ground engineer: J. Gallagher. 1 (RX). R.X. in commission all the week. Weather unfit for flying for four days. Flying time for week: 10 hrs. 35 mins. The pupil with the highest total flying time for week is Mr. S. P. Tyzack, 2 hrs. 35 mins.

NOTTINGHAM AERO CLUB

(MAY 4–10).—Total flying time: 15 hrs. Messrs. Kay, Granger (advanced dual), Hutchinson, Cudley, Nicholson, Thorpe.

"A" Pilots: Messrs. Wynn, Selvey, Kay, F. Granger, Taylor, Bradley, Ball, Warren. Number of passengers carried: 5.

Miss Brown paid us a visit, flying her Avro-Avian on her way to Gleneagles; she was making a detour on account of bad weather.

Mr. Clarkson flew down to Croydon to take passage by air to the Continent. Mr. Warren, an original R.F.C. pilot, has just been granted his "A" licence. Our flying time is rather low on account of rain and high winds.

SCOTTISH FLYING CLUB, LTD.

Report for two weeks ended May 18, 1929:—

(MAY 5–18.)—Chief instructor: R. M. Stirling, A.F.C. Ground engineer: W. A. B. Calder. Machines in commission during period: X Moths G/EBYG and G/EBUX.

Total flying time: 63 hrs. 25 mins. Dual instruction: 29 hrs. 30 mins. Solo flying: 10 hrs. 20 mins. Passenger flights: 21 hrs. 15 mins. Tests: 2 hrs. 20 mins.

Instruction (with Mr. Stirling): Messrs. H. E. Fairley, R. R. Allan, A. H. Anderson, D. A. Graham, A. B. Walter, A. Cairns Smith, D. Barclay, L. C. Davey, G. C. Forsyth, J. C. McDougall, J. Sorel-Cameron, A. Campbell, A. McIlwaine, J. E. R. Young, K. Templeton, D. Lloyd, N. Chalmers, M. Findlay, J. Jamieson and Miss E. A. R. Anderson; (with Mr. Yuill): Messrs. H. E. Fairley, D. A. Graham, D. McIntyre, A. McDonald, C. M. Brown, R. Y. Dickson; (with Mr. Steele): Messrs. J. Naismith, H. G. Campion, and A. B. Fairley.

With nearly 20 hrs. more than the previous fortnight, our flying time pleasantly reflects the improving weather and the lengthening days. Coupled with this, or probably as a result of it, there has been a most marked increase in interest and in general enthusiasm, as evidenced by the steady increase in our membership and in the number of pupils under instruction. On Sunday, May 12, with only two machines in action, 15 hrs. 30 mins. total flying was completed, constituting a one-day record for the club. On May 17, Miss E. A. R. Anderson carried out a most satisfactory first solo, to be followed on the 18th by a similar performance by Mr. D. A. Graham. Both are to be congratulated, and we look forward to their obtaining their "A" licences very soon.

On Tuesday, May 7, we were very pleased to welcome Capt. Dismore, of Imperial Airways, who visited us in the Avian G/EBZD, and later in the week we had the pleasure of receiving two more guests in Mr. E. F. Storey and Mr. J. D. Irving, both of whom arrived in Moths. Another welcome visitor on Thursday, 17th, was Capt. A. N. Kingwill, in Messrs. Northern Air Lines' Moth. When visiting Stag Lane, on Sunday, May 5, one of our members, Mr. D. K. Fairweather, was exceedingly impressed by the courtesy and attention given him by Messrs. De Havilland, and asks us to record his appreciation.

Arrangements in connection with the Garden Fête to be held at Crosslees,

Thornliebank, on Saturday, June 8, are now almost completed, and it is hoped that members and friends will give the function every support.

Members and visitors are again reminded that the club closes down on Monday of each week as a general staff holiday.

SOUTHERN AERO CLUB

(APR. 29–MAY 5).—On Saturday, the Sussex County Clay Pigeon Shooting Club held a meeting on the aerodrome, and a large crowd turned up at this. Subsequently we were able to carry a number of joy-riders. The proceeds of the meeting were in aid of the Hove Hospital. During the week Mr. Law visited us on his Moth YJ.

No flying was possible at all during Sunday, owing to the incessant rain and very low cloud.

YORKSHIRE AEROPLANE CLUB

(MAY 5–11).—Pilot instructor : Flight-Lieut. H. V. Worrall. Ground engineer : R. Morris. Assistant ground engineer : G. Speight. Machines in commission : 3 (RF, SV and BD). Flying time for week : 27 hrs. 20 mins.—Instruction : 14 hrs. 35 mins. (13). Soloists : (5) 5 hrs. 40 mins. "A" pilots : (4) 5 hrs. 20 mins. "B" pilots : (1) 15 mins. Passengers : (5) 50 mins. Test flights : (4) 40 mins.

Mr. Bamford successfully passed his tests for his "A" licence, and Mr. Moon did his low test. On Thursday, Mr. Stead commenced dual instruction.

On Saturday we had several visitors, including Lady Bailey, who were on their way to Gleneagles.

(MAY 12–18.)—Pilot instructor :—Flight-Lieut. H. V. Worrall. Ground engineer : R. Morris. Assistant ground engineer : G. Speight. Machines in commission : 3 (SV, RF, and BD). Flying time for week : 27 hrs. 10 mins. Instruction ; (13), 10 hrs. 25 mins. Soloists : (10), 11 hrs. 15 mins. "A" pilots : (7) , 3 hrs. 35 mins. Passengers : (6), 1 hr. 10 mins. Tests : (5), 45 mins.

Mr. Garnett, Mr. Pollock and Mr. J. Birch, all of whom only recently commenced instruction, succeeded in doing very creditable first solos.

Mr. Moon completed his tests for his "A" licence.

We had a visit from Lord Ossulston on Thursday in his Moth G-EBWL.

Mr. Ambler succeeded in being second to land nearest to 5 o'clock at the rally at Gleneagles.

FROM THE FLYING SCHOOLS

Brooklands School of Flying, Brooklands Aerodrome

(APRIL 29-MAY 5).—Instructors for the week.—Capt. H. D. Davis, A.F.C., Capt. E. A. Jones, Major C. M. Pickthorn, M.C., J. M. Oliver. Machines in commission : EM, DT, CA, WJ, MV. Flying time : 24 hrs.

The weather did not deter a number of our old friends and some new ones coming to our "At Home" on Sunday. We congratulate Mr. Wodehouse on passing his tests during the week. His performance on his height test was a masterpiece of airmanship.

Mr. Berby, Capt. Black and Mr. R. H. Wood, are welcomed as new pupils. The last-named has not flown since R.F.C. days and shows astonishing skill for so long a period of inaction.

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Swedish Aerotransport Company's Activities

THE Aerotransport Company, the national aviation concern of Sweden, has just issued its annual report for the year 1928, showing that, in spite of the unfavourable weather conditions, the number of passengers carried increased since the preceding year and in 1928 amounted to nearly 15,000 persons, while the mail transport has increased by 125 per cent. The regular continental traffic via Malmoe, began on April 8, and will be maintained daily throughout the coming season, and will this year also include Sundays during the months of June, July and August. The lines Malmoe-Amsterdam-London, Malmoe-Amsterdam-Paris and the lines to Finland will henceforth be carried on under the joint name of "The Scandinavian Air Express." The cost for excess luggage has been reduced and return tickets with a 10 per cent. reduction have been introduced. The machines of the Aerotransport Company have been partly rebuilt, and further improved during the winter, so as to provide still more comfort for the passengers. At the Malmoe Air Port a new hangar is being completed, and night illumination as well as other improvements and extensions have been introduced. During the past year the Aerotransport Company sent its large three-motor machine "Upland" to Spitzbergen, where it successfully took part in the Nobile rescue expedition. Further, eight experimental night mail flying trips were made to London, in co-operation with the Government Postal Department. The company during the year also performed 15 ambulance flights to fetch sick persons from out-of-the-way parts of the Stockholm archipelago, and in several cases thus saved human lives. It also performed a remarkable round-Sweden flight, visiting 124 different places in the country and carrying 10,251 passengers. At the civil aviation school of the company, 33 pupils obtained their flying certificates without any mishap. 4,000 photographs from the air have been taken from the planes of the company during the year. The Aerotransport Company flying statistics for 1928 show 2,408 flying hours, and a total stretch flown of 336,118 kms.

The company has now completed its fifth year of activity without one single accident or injury to any passenger.

German Flying Club Accidents

THE *Daily Telegraph* Aviation Correspondent states, in view of the number of accidents at the flying schools in Germany, the British Aviation Insurance Group, which control Geman insurance through their local representatives, have sent a mission to carry out an investigation on the spot. Captain Lamplugh, who is the head of the B.A.I.G. left Stag Lane Aerodrome on May 10, piloted in a Gipsy Moth, by Captain C. A. Pike, of the De Havilland Flying School. The objects of the trip are twofold. Firstly, Captain Lamplugh wants to get first-hand information as to the suitability of the training aircraft which the Germans are employing, the running of their organisation, and their methods of training. Secondly, it is desired to exhibit the "Moth" as an example of the latest training aircraft employed by the Royal Air Force. Captain Pike has had long experience in training officers of the Royal Air Force Reserve.

(MAY 6–12).—Total flying time : 32 hrs. 10 mins.

Three days out of the seven were out of the question as regards flying, and the flying time has suffered accordingly.

The J.C.C. Double Twelve Race caused a certain amount of stir and the joy-riding machines were kept fairly busy, carrying 327 passeners during the race. Mrs. W. B. Scott, one of our private owners, put up a marvellous show of driving and endurance on her Bentley, and only retired 2 hrs. before the finish. A number of the prominent racing drivers are now taking a serious interest, and many of them are taking lessons at the School.

Maj. Pickthorn and Capt. Jones flew to Lympne on Sunday and landed, with a visibility of roughly 100 yards.

The School has now acquired another "Moth" and sold a new "Gipsy."

Brough Flying School, North Sea Aerial and General Transport, Ltd.

(APRIL 28–MAY 4).—Our flying time for this week totals 63 hrs. 50 mins. Flight-Lieut. Hall and Flying Officers Rolfe, Woodward, Thomas, Ashley and Shephard received 5 hrs. 15 mins. dual on "Darts" with Messrs. A. G. Loton and J. B. Stockbridge and carried out 31 hrs. 55 mins. solo.

Flying Officer Thomas and Flight-Lieut. Hall left on Wednesday, having completed four quarters, and two quarters' training respectively. Flying Officer Shephard left on Saturday, having completed four quarters' training.

14 hrs. 40 mins. flying was carried out on "Bluebirds" during the week, of which 6 hrs. was dual instruction for Pilot Officer Walker and Mr. H. W. Hall.

On the seaplane school, Flying Officer Campbell and Flight-Lieut. Wilson received 1 hr. 20 mins. dual with Flight-Lieut. N. H. Woodhead and carried out 10 hrs. 25 mins. solo. Flight-Lieut. Wilson completed two quarters' training on Tuesday and Flying Officer Campbell four quarters on Friday.

(MAY 5–11).—Our flying time for the last week has declined to a total of 33 hrs. 10 mins., owing to the fact that high winds have seriously interfered with flying and on several occasions have stopped it completely.

Flying Officers Woodward, Ashley, Moon, Rolfe and Rogers received 3 hrs. 55 mins. dual on "Darts" with Messrs. A. G. Loton and J. B. Stockbridge, and carried out 15 hrs. 15 mins. solo.

Pilot Officers Walker and Curtice and Messrs. Hall and Ellis had 5 hrs. 15 mins. dual on "Bluebirds," but no solo flying was possible.

Flying Officers Mayer and Kent received 50 mins. dual on "Velos" seaplanes with Flight-Lieut. N. H. Woodhead, and carried out 5 hrs. 35 mins. solo flying.

Flying Officer Woodward completed two quarters' training on Wednesday, and Flying Officer Rolfe three-quarters, and Flying Officer Kent two-quarters on Friday.

Phillips and Powis School of Flying, Reading Aerodrome

(MAY 6–12.)—Flying times as follows :—Dual instruction : 12 hrs. Solo (pupils) : 4 hrs. 35 mins. Journeys, etc. : 1 hr. 55 mins. Passenger flights : 4 hrs. 45 mins. Total flying time : 23 hrs. 15 mins.

The school's 18 pupils are making good progress under Mr. Shepherd and Mr. Mickelmore.

The non-appearance of the right conditions have prevented our first three pupils from undergoing their height and other "A" licence tests, but they are expected to do so any day.

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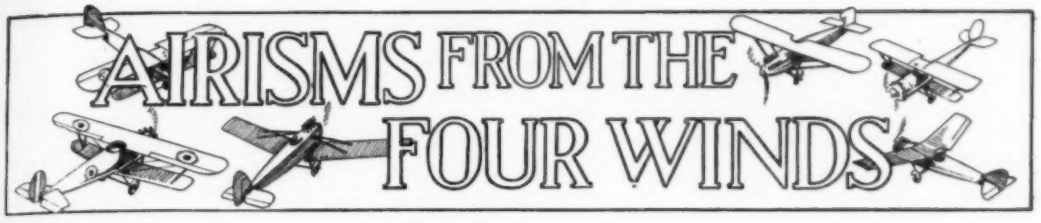
The First Geared and Supercharged Engine

IN our article on the Armstrong Siddeley Aero Engines, published in FLIGHT of May 2, 1929, the statement was made that this firm was the first to produce a geared and supercharged aero engine. It has been pointed out to us that this is incorrect, and that in point of fact the Bristol Aeroplane Co., Ltd., delivered such an engine as long ago as last September. The statement arose out of a misunderstanding on the part of the writer of the article, who interpreted "geared supercharged" as geared *and* supercharged, whereas actually the word "geared" referred to the means of driving the supercharger, and *not* to reduction gearing of the airscrew. It is hoped that this explanation makes the position clear.

"Punch" Summer Number

WHAT a wealth of humour is set out in this year's Summer Number of *Punch!* It is always a joy to look forward to, and the 1929 issue just to hand, particularly rich in coloured illustrations, excels all previous numbers. Naturally there are digs at aviation, appreciated by the craft equally with the public, whilst with such delightful *Punch* artists as Frank Reynolds, Arthur Watts, A. L. Stampa, Lewis Baumer, E. H. Shepards, Bateman, Bert Thomas, Wallis Mills and a host of others, the marvel is how it is all done for the modest shilling, not forgetting altogether the literary pages which go to make up this very welcome harbinger of Summer—at least we *hope* that is the real omen.



Australian Flight

FLT.-LT. J. MOIR and F./O. H. OWEN, the Australian airmen who are attempting to fly to Australia from England in the Vickers "Vellore" ("Jaguar") are missing. They left Bima, on May 18, for the 1,000-mile stage to Port Darwin, which included the crossing of the Timor Sea, a distance of 500 miles, but have not been reported as arrived. The machine was sighted as it passed over Koepang, to begin the long sea flight. This stretch is not a shipping route, so that it is particularly lonely.

Light 'Plane Tour of Australia

CAPTAIN GROSVENOR, A.D.C. to the Governor of South Australia, who left Adelaide on May 6 on a solo D.H. "Moth" flight round Australia, arrived at Darwin (Northern Territory) on May 17. He searched 400 miles from Darwin for the missing Vickers "Vellore."

Solo Flight to India Planned

MR. P. M. KABALI, a young Indian, proposes to make a solo flight to India. The flight will be made in his own machine by stages, and will finish at Karachi. Mr. Kabali was entertained at tea recently at the National Liberal Club by Colonel Nawab Sir Umar Hyat Khan, Sir Dorabjee Tata, and others. Among those present was the Maharajah of Burdwan. The airman received a number of good wishes, including messages from Lord Peel, Secretary of State for India; Lord Winterton, Under-Secretary for India; Sir Atul Chatterjee, High Commissioner for India; Sir John and Lady Simon; The Aga Khan; and Sir Arthur Froom. Mr. Kabali has only recently learned to fly and taken his licence.

Night Air Line

A LINE of beacons has been established along the Brussels-Ostend road. These are to be utilised in connection with the new aeroplane night service between Brussels and London. In July, trial night trips will be made, the intention being to start the regular service with England next September.

Aviation in the Arctic

SPEAKING at the Oxford Luncheon Club recently, Mr. Vihjalmur Stefansson, the explorer, urged that the best route from Vancouver to England was certainly across the Arctic, and that to fly from Newfoundland to Ireland was commercially impracticable. They had been deluded by Mercator's Chart into thinking that the Arctic was large, but it was merely a gulf running out of the Atlantic. He reaffirmed the claim of Sir Hubert Wilkins that landing places might be found anywhere in the Arctic.

American Output

THE output of American aeroplanes in 1928 was 4,346, built in American factories, and valued at close upon £9,000,000. This return contrasts with the corresponding figures for 1926, when the total output of aeroplanes just exceeded 1,000, the value being placed at £1,500,000.

France and The Schneider Trophy

The Times states that the French Air Minister, M. Laurent Eynac, declared at a luncheon to members of the sporting Press that he had decided in principle on the participation of the French team in the race for the Schneider Trophy, but the machines would require long adjustments and trials, and consequently the French entry depended upon whether the aeroplanes, which might give France a real chance of victory, could be turned out in time. If France did enter the contest, her team would be composed of three competitors and three reserves, who would begin training on July 1.

Entries for King's Cup Air Race

INTENDING competitors are reminded that the entries for the King's Cup Air Race close at 5 p.m. on Friday, June 7. Regulations and entry forms can be obtained on application to the Royal Aero Club, 3, Clifford Street, London, W.1.

Glider Record?

STARTING from a height in the neighbourhood of Riesenburg, W. Prussia, and landing near Detmold, Lippe, Herr Kronfeld is reported to have made a glider flight of over 62 miles in 5½ hours.

Graf Zeppelin Returns

ENGINE trouble caused the *Graf Zeppelin* to abandon temporarily its second attempt to cross the Atlantic. It left Germany on Thursday, May 16, in the early morning, and flew down to the South of France and into Spain, passing over Lyons, Valence, Nimes, Marseilles and Barcelona. Half-an-hour after the airship had passed over Saragossa in Spain, it wirelessed that a return was being made owing to engine trouble. It seems that the crankshaft of one of the Maybach starboard engines had suffered serious damage owing to a flaw in the material, which had necessitated placing the corresponding port engine out of action, although it was running normally. Then the fifth, the forward engine, was also stopped for emergency use, meanwhile, the ship ran on two engines. It was with this greatly reduced engine power that the airship encountered the Mistral in the Rhone Valley and was severely buffeted and delayed all day Friday. Finally, it was turned back towards the Mediterranean as the French had wirelessed permission for a landing at the French aerodrome at Cuers-Pierrefeu, near Toulon, where it landed safely on Friday evening with the expert assistance of a large French landing party, and was placed in the shed formerly used by the *Dixmunde*. There were 17 passengers on board beside a crew of 41. Sir Hubert Wilkins was a passenger. Dr. Eckener was in command; Germany officially thanked France for its skilful and generous assistance. New Maybach engines are being installed in the ship and Dr. Eckener hopes to fly the *Graf Zeppelin* from Toulon to Friedrichshafen towards the end of this week. Some French officers will accompany him.

Italian Aviation Items

OUR Italian correspondent writes as follows:—A large number of students from the French University of Grenoble, representing 20 different nations, are on an instruction tour in Italy. They visited the Littoria Airport at Rome and admired its modern and complete installation. A "Superwal" seaplane of the regular Rome-Tripoli air line was obliged to land at Soverato because of heavy fog. It was later able to leave again, and it safely reached its destination. The "Official Gazette," publishes a new decree with the appointment of the Hon. Count Piero Ferretti to secretary of the National Fascist Association for air personnel. The "S.A.M." Aircraft Operating Company has now eight "Savoia 55" seaplanes in service on the Rome-Saradegna line. They are fitted with "Isotta Fraschini" 500-h.p., "Asso R." engines with reduction gear. Among the 44 entries, which closed in Paris on April 24, for the "International Tourist Challenge," twelve are for Italian aeroplanes. The competition will be over a distance of 6,042 km. comprising the principal capitals of Europe. At the coming London Olympia Aircraft Show, the following Italian companies will exhibit: Fiat (aeroplanes and engines); Isotta Fraschini (engines); Salvator (parachutes); and the "Aerial Survey Company." In a reunion of the Turin Counsel, Count Paolo Tahon di Revel said he has decided to build a seaplane station worthy of the importance of the town that saw the birth of Italian aviation. Between May 27 and June 9 there will be held at the Littorio Airport, Rome, by permission of His Excellency Benito Mussolini, an aircraft show for private civilian machines of less than 100 h.p., and also accessories, safety devices for flight, lubricants, papers and magazines on Italian aeronautics, flying suits, and old materials of aviation history; this is part of the "Roman Spring" festivals.

Searching for the "Italia"

THE Italian expedition formed to search the Arctic regions for traces of the lost airship *Italia* and members of her crew left Bergen, Norway, on May 15.

New Zealand Item

MAJ. T. M. WILKES, Director of New Zealand Air Services, is leaving soon for England, where he will be attached to the Air Ministry. Capt. J. L. Findlay, of the New Zealand Air Force, is coming to England for a year's refresher course.

CIVIL AVIATION PROSPECTS IN EAST AFRICA

THE paper bearing above title, read by Mr. F. Tymms, M.C., A.F.R.Ae.S., before the Royal Aeronautical Society on May 9, deserves the widest possible attention, and had space permitted FLIGHT would have published it in full. That, however, is not possible, and it has been necessary to omit the first part of the paper, in which Mr. Tymms dealt with the geography, topography, climate and trade of Kenya, Uganda and Tanganyika. The lecturer's brief summary of the various features of these three countries was extraordinarily interesting, and of the greatest value, but as space does not permit of giving the paper in full, it was the section which, reluctantly, we decided to omit. Finally, it should be pointed out that Mr. Tymms was seconded to the governments of Kenya, Uganda and Tanganyika for duties in connection with civil aviation, and that the paper is an outcome of a tour which he made last year, between January and August. Thus, the paper contains conclusions arrived at by Mr. Tymms after personal observations made on the spot.

The Cairo-Cape Town Air Service

The Route.—Undoubtedly the most important aviation development in prospect for East Africa arises from the fact that the British route to South Africa must pass through, not one, but all three of the territories we are dealing with. A glance at the map of Africa is sufficient to show that the valley of the Nile, if not the only feasible route to Central Africa, is without doubt the most practicable. Neither the east coast nor the west coast offers anything like the same advantages in the way of settlement or ground communications to facilitate the establishment of the airway, and for the rest, the Sahara stretches its arid, uncharted wastes as a barrier—though not insuperable—from the western to the eastern limits of the Continent.

The flights of the Royal Air Force, Sir Alan Cobham, and Capt. Gladstone have been the chief instruments in consolidating the knowledge of the route first flown by Sir Pierre Van Ryneveld and Sir Christopher Brand in 1920. As a result of these flights and recent investigations, it has been decided to modify the civil air route from Lake Victoria to Northern Rhodesia; from Kisumu on Lake Victoria, it will pass over more settled regions via Nairobi, Arusha, Dodoma and Mbeya, rejoining the original route at N'dola, in Northern Rhodesia, thus eliminating Tabora and Abercorn and the sparsely populated bush region lying between. From N'dola south, the route will practically follow the Cape Railway.

It will be noted that the chief centres of commerce in Central Africa lie along the coast—Mombasa, Tanga, Dar-es-Salaam, etc.; the chief centres of industry lie outside British territory, in the north-east and south of the Belgian Congo—Kilo-Moto mines and Katanga mines; while the line chosen for the through route links the chief centres of settlement—Kenya Highlands, Arusha, Iringa Highlands, and the Fife district.

Some parts of the route are suited to the operation of seaplanes, others to the operation of landplanes. From Cairo to Khartoum the terrain is desert, and the Nile is an uncertain river winding between sand-banks. Landing grounds are easily prepared and easily maintained, safe forced landing grounds are abundant, and generally the operation of aeroplanes presents less difficulty than the operation of seaplanes.

From Khartoum to the southern border of the Sudan, the region of tropical rains having been entered, the soil is either black cotton soil or swamp, the making of all-weather landing grounds is either difficult or impossible, and the Nile and lakes provide admirable alighting places for seaplanes. From Khartoum to the lakes of Central Africa, therefore, the route is only feasible as a seaplane route. Detours either to the west or east, to avoid the impossible area of the sudd, involve flight over partially isolated or even unknown regions where the problem of supplies would at present be insurmountable.

South of Lake Victoria, while both Mittelholzer and Sir Alan Cobham have completed the flight by seaplane to the coast of Portuguese East Africa, the difficulty of making and maintaining landing grounds is not great, and there are long stretches of land between suitable alighting places for seaplanes. From Kisumu to Cape Town, therefore, is a land machine route. Kisumu under this arrangement becomes an important change-over station, and it is, fortunately, ideally suited for this purpose, having a landing ground in close proximity to the lake.

Following the support given to Capt. Gladstone for his experimental service from Khartoum to Kisumu, the three East African Governments and the Sudan decided in 1928 to support with subsidy a permanent service. In the debate on the Air Estimates in March the Secretary of State for Air announced that it had been decided to proceed with the development of the African service. It goes without saying that it will not be possible to develop the whole route at one time, and the first section to receive attention will be that from Egypt to East Africa. In order to provide a connection to Tanganyika, it is contemplated that the service should be extended to Mwanza, the terminus of the newly-opened branch line from Tabora. When the southern section of the line via Dodoma is opened this extension from Kisumu will become of less importance, and may be abandoned.

Traffic.—The following tables and data give an idea of the amount of traffic on which the air service on this section may draw. The figures represent approximate averages. Mails are given separately for each country.

Mail Traffic

Sudan	Letters. Lbs.	Newspapers. Lbs.
Inward mail from London per week ..	840	9,000
Outward mail to London per week	700	—
Inward mail from Egypt per week	4,900 (includes newspapers).	—
Outward mail to Egypt per week	2,400	—
Transit mail to Belgian Congo (via Rejaf) ..	70	2,300
Transit mail from Belgian Congo (via Rejaf)	70	—

Dispatches (via Congo) to and from Khartoum, bi-weekly in the winter, weekly in the summer.

Kenya and Uganda.	Letters. Lbs.	Parcels. Lbs.
Inward mail from London per week ..	650	22,000
Outward mail to London per week	650	1,500
Inward mail from India per week	550	370
Outward mail to India per week	550	370

Dispatches of mail are irregular; there is no regular mail-boat service to East Africa. The average interval between London mails is five days, but this sometimes extends to 12 days. The average time of transit is 19½ days. To India the average time of transit is 9½ days, and the average interval 11 days.

Tanganyika.	Lbs.
Weekly weight of mail in each direction (London) ..	200
Weekly weight of mail in each direction (India)	120
Weekly weight of mail in each direction (Congo transit) ..	140

As in the case of Kenya, there is no regular mail. There is an average of four mails a month to and from Great Britain and two to India. The interval between mails extends sometimes to 18 days and 14 days respectively. The average time of transit is 22 days to London and 12 to Bombay.

Passenger statistics are given in the following table. Owing to the difficulty in collecting statistics, these figures are only roughly correct.

Passenger Traffic

Between	First-class Passengers annually.
Cairo and Khartoum	3,500
Khartoum southwards by Nile steamers	1,200
Khartoum and Europe via Port Sudan	No figures
Mombasa and Europe	10,250 (includes 2nd class)
Mombasa up-country	6,000
Dar-es-Salaam and Europe	2,500
Belgian Congo and Europe via D.S.M.	1,200

Figures represent traffic in both directions.

There is very little freight of such a nature as will bear the cost of air transport to and from the Sudan or East Africa. Occasionally there may be a demand for the transmission of samples of agricultural produce to the London market, and a certain amount of the parcel post, which is naturally heaviest to Kenya, may be attracted to the air route, either as air mail or freight. The most promising source of freight, however, appears to be the gold from the Kilo-Moto mines in the north-east of the Belgian Congo, and as the mineral resources of the Sudan, Uganda and Tanganyika, which are being actively exploited, develop, this carrying trade may become of some importance. The carriage of specie between Egypt and the Sudan also offers an opportunity for the saving of both time and money.

As is to be expected, with an air service through territory whose communications are only partially developed, considerable time savings will be effected by the use of the air service. The following table shows the savings expected between London and various places as far south as Cape Town, on the assumption that the air service is used right through to London.

Cape-Cairo Air Route

Time Saving from London

Place	Present Route Method	Air Service Time	Time Saving
	Via Lloyd Triestino Route to Alexandria, and thence by	Days	Days	Days
Egypt.				
Assouan ..	Rail, weekly	5¼	4¼	1¼
Sudan.				
Wadi Halfa ..	Rail and Nile steamer, bi-weekly ..	9	4½	4½
Atbara ..	Rail and Nile steamer, bi-weekly ..	9½	5½	4½
Port Soudan ..	Rail and Nile steamer, bi-weekly ..	11 (including rail)	6½	4½
Khartoum ..	Rail and Nile steamer, bi-weekly ..	10	5½	4½
Khartoum ..	Rail and Nile steamer, bi-weekly ..	10	5½	4½
Malakal ..	Rail and Nile steamer, bi-weekly ..	14	6½	7½
Mongalla ..	Rail and Nile steamer, bi-weekly ..	21	6½	14½
	Via Overland Route to Marseilles; P. & O Steamer to Port Said and thence by			
Uganda.				
Entebbe ..	Rail and sea, via Suez, irregular ..	21	7½	13½
Kenya.				
Nairobi ..	Rail and sea, via Suez, irregular ..	20	7½	13½
Mombasa ..	Rail and sea, via Suez, irregular ..	19	8	11
Tanganyika.				
Dar-es-Salaam	Sea via Suez, irregular	21	9½	11½
Tabora ..	Rail and sea, via Suez, irregular ..	22½	9	13½
	via Sea to Cape Town, and thence by			
Northern Rhodesia.				
Broken Hill ..	Rail, weekly	21	10	11
Southern Rhodesia.				
Salisbury ..	Rail, weekly	21	12	9
Bulawayo ..	Rail, weekly	20	11	9
Union of S. Africa.				
Johannesburg	Rail, weekly	18–19	11½	6½–7½
Durban ..	Rail, weekly	19–20	12	7–8
Cape Town ..	Rail, weekly	17	12½	4½

It will be seen that there is a considerable volume of traffic to be dealt with, and that the time savings are considerable. The prospects for the service, therefore, while not as good as on such a route as the Indian route, are not unfavourable commercially. The completion of its development through to South Africa will have the important political result of linking up the two important areas of white settlement, East Africa and South Africa, which are now separated by great distances, and practically non-existent overland communications.

Other Air Services

Boma to Elizabethville.—Without doubt one of the richest territories in Africa, the Belgian Congo, cannot fail to be an important factor in the development of air communications in Africa. To the Belgians, in fact, must be given the credit of having first introduced regular air transport into tropical Africa in 1925, and of still holding the field alone with their service from Boma to Elizabethville. How important this service is can only be realised by those who have appreciated the enormous mineral wealth of the Katanga region.

Connection with the Cape Route.—It is inevitable that the aerial activities of the Belgian Congo must be co-ordinated with British development in

Note.—The data used in this section has been drawn from the reports published by the Departments of Agriculture of the three territories, Kenya, Uganda and Tanganyika, and from the following papers: "The Distribution of Rainfall over Uganda," by C. E. P. Brooks, *Quarterly Journal of the Royal Meteorological Society*, October, 1924; "Climatological Studies; German East Africa," by H. G. Lyons, *Quarterly Journal of the Royal Meteorological Society*, April, 1917; and a summary of the climatic conditions for aeronautical purposes produced by Capt. F. Entwistle, of the Meteorological Office. I have to thank Capt. Entwistle for his advice on this section.

East Africa. While the Belgian authorities have, after investigating the Nile and other routes, decided to establish, in co-operation with the French, a trans-Saharan air route, connecting with the existing air line at Bandundu, they are also considering a connection with the British route at Juba in the southern Sudan or Butiaba in Uganda. Two possible routes are then open—(a) via Stanleyville to Boma and thence by the existing line to Elizabethville; (b) down the eastern side of the Congo connecting with the new Belgian provinces of Ruanda and Urundi, parts of which are being developed as white settlement areas.

It is a legitimate Belgian ambition to direct some of the traffic from the Union of South Africa and Rhodesia to their main trunk air line, and they will seek to extend their line from Elizabethville in the south to N'dola, to connect with the British line there. In the meantime their plans involve an extension from Elizabethville, in conjunction with the Portuguese, to Mozambique, and thence, with the French, to Madagascar.

Belgium to the Congo.—Within the next few years, then, there will be two routes to South Africa, a Saharan and a Nile route, the former also giving access at two points to British Central African territory—in the southern Sudan or Uganda and in Northern Rhodesia. In passing, it may be noted that the Belgian-French trans-Saharan route will be well placed to provide a connection with Nigeria, which, however, may also be served by an extension of the French coastal route from Dakar.

Livingstone to Lobito Bay.—An interesting probability is a route from Livingstone along the Zambezi valley and through Portuguese West Africa to Lobito Bay. The new service to be provided by the Union Castle Steamship Co. to this port will enable a considerable saving of time to be effected in passages from South Africa.

Internal Air Routes

There does not appear at the moment to be a prospect of success for a regular commercial air service internally in East Africa, but the increasing demands for mobility on the part of the white settlers and business men, coupled with the possibility of assisting administration and the desirability of effecting closer union between the three territories, by speeding up their communications, points inevitably to the necessity of preparing and maintaining certain key air routes, and does hold out a prospect of success for a "taxi" organisation. Important factors are the lack of railway connections in a north-south direction, though there are three lines of lateral rail communication (already referred to), the slow average speed of rail travel (15 m.p.h.), and the dearth of roads, particularly again in a north-south direction, while most of the roads, except in Uganda, become impassable for several months at a time during the rains.

Main Routes.—The three routes which appeared to call for early development are:—

(1) Entebbe, via Jinja, Kisumu and Nairobi, to Mombasa.
This broadly follows the Kenya-Uganda railway.

(2) Nairobi to Dar-es-Salaam, via Moshi.

(3) Nairobi to the southern highlands of Tanganyika, via Arusha, Dodoma, Iringa and Mbeya.
This, it will be observed, is a section of the main civil air route to the Cape.

The administrations of all three territories have adopted programmes which will eventually result in the establishment of landing grounds approximately every 50 miles along these three routes, while in Kenya, through the activities of the Aero Club of East Africa, a start has already been made with the provision of landing grounds at other centres of settlement in the highlands, which will make it possible to reach most important places in the Colony by air from Nairobi. Most of the landing ground sites along the three main routes have been selected.

(1) *Entebbe to Mombasa* (660 miles).

Landing grounds have either been prepared or sites have been selected at:—

ENTEBBE.—Administrative capital of Uganda; 25 miles from the commercial capital Kampala; site now partially prepared.

JINJA.—An original Cape route landing ground; present railhead of the Kenya-Uganda railway; source of the Nile-Ripon Falls.

TORORO.—An important junction station on the K.U.R.

KISUMU.—An original Cape route landing ground; to be developed into a combined aerodrome and seaplane station for the service to South Africa.

LONDIANI.—An emergency landing ground at 7,500 ft. on the Mau Plateau.

NAKURU, NAIVASHA.—Centres of white settlement, the former a thriving township, in the Rift Valley.

NAIROBI.—Capital of Kenya and the centre of white civilisation in East Africa; new aerodrome now prepared.

MAGADI JUNCTION, MAKINDU, KANGA, VOI, MACKINNON ROAD.—Stations on the K.U.R. Voi alone is of any importance, as the junction for connection to the Tanga railway of Moshi. Important sisal estates are situated here.

MOMBASA.—The port for Kenya and Uganda, and a rapidly growing town; a landing ground has been selected, which may ultimately be developed into a combined airship station and aerodrome; a seaplane station site has been selected nearby.

The journey from Entebbe to Mombasa takes about 2½ days, and could be done in 7 or 8 hours by air. Trains now run twice a week to and from Jinja. This route could be used, with a slight extension, for flights to the Kilo-Moto area of the Congo, which would show a saving of 4 or 5 days over the boat and train journey. A few Belgian passengers travel via Mombasa and Butiaba.

(2) *Nairobi to Dar-es-Salaam* (439 miles).

Landing ground sites have been selected along a part of this route. The most important are:—

KAJIADO.—Station on the Magadi railway; administrative centre for the Masai district.

LONGIDO.—Frontier station in the north of Tanganyika.

MOSHI.—Important white settlement centre at the foot of Mt. Kilimanjaro.

Thence the route will follow the Tanga railway to Korogwe, thence via Saadani, on the coast, to Dar-es-Salaam.

This route joins obliquely the three main railway lines of East Africa. Via Mombasa, it takes 3 days to get from Nairobi to Dar-es-Salaam, the sea journey occupying 2 days; via Kisumu, Lake Victoria steamers, Mwanza and Tabora by train, it takes 5 days; at times it is possible to motor from Nairobi to Dodoma on the Tanganyika Central Railway and complete the journey in 3 or 4 days.

(3) *Nairobi to Mbeya* (634 miles).

The main landing ground sites are:—

ARUSHA.—Important administrative and white settlement centre at the foot of Mt. Meru.

DODOMA.—Station on the Tanganyika Central Railway and administrative centre.

IRINGA.—A very important and developing white settlement district; large native town and administrative centre.

MBEYA.—A new administrative station and customs post on the main road to Rhodesia.

Other landing grounds have been selected as emergency landing grounds mostly on bush country. This route follows the main north-south road to Rhodesia. Its use will be chiefly as an alternative route to South Africa and facilitates inter-communication between the settlement centres of Tanganyika and Kenya.

Throughout the Report of the Closer Union Commission it is stressed that quicker and better communications are needed to facilitate that so much desired and so much abhorred, yet inevitable, closer union. With regard to Nyasaland and Northern Rhodesia, in fact, the conclusion is drawn that the entire lack of communications between them and their northern neighbours is the chief obstacle to any form of political union or co-operation at the present time. It is not inappropriate, therefore, that at this time of political development in East Africa, aviation should step on to the stage and play its part.

In this connection it is of interest to note that the Associated Chambers of Commerce of East Africa, in August, 1928, passed the following resolution:—

> Civil Aviation: "That this Association desires to call the attention of the Government of Kenya, Uganda and Tanganyika to the urgent necessity of making provision for the establishment of inter-communication by air transport between the three territories, in addition to the Imperial Airway routes, and recommends that:—
>
> (*a*) Land shall be reserved in the town planning of every township for an aerodrome and landing ground; (*b*) Suitable landing grounds shall be developed at intervals along all routes which can produce traffic; (*c*) Every encouragement shall be given to any company or companies of approved repute which may develop an air transport service in the territories; (*d*) Investigation should be made to ascertain how far the Governments can support air transport service by using aircraft for urgent official journeys and for the carrying of despatches and public mails."

Topography of the Internal Routes

Before proceeding to the present and probable future aviation activities in the country, a pen picture of the topography of these three air routes in amplification of the topographical notes given earlier will be of value as a key to the conditions to be dealt with.

The *Entebbe-Mombasa* route starts in the peculiar Buganda country, than which there is nothing more unfavourable to aviation. Over an area extending almost 100 miles in all directions from Entebbe, the Archæan rocks have been weathered down from the original peneplain, forming a succession of hills and valleys of almost uniform height (300 to 500 ft.), with an abundance of fertile soil. A vast tropical forest once covered this area, and much isolated forest still remains. The valleys are without exception, choked by papyrus swamp. For the rest, the fertile soil has attracted a dense population (the Waganda) and lead to dense cultivation—bananas and sweet potatoes. All which is not forest, bananas, or papyrus swamp is covered with a rank growth of elephant grass, reaching anything from 12 to 15 ft. in height.

After much labour, only one landing ground site could be found in the whole of this area—Entebbe. Jinja already existed, but is a very indifferent landing ground on account of the contour of the ground.

From Tororo to Kisumu the country is of a very much more open type, with light bush and some open grass plains. The altitude lies between 3,700 and 4,500 ft. From Kisumu to Nairobi one passes over the white settled area. East of Kisumu one crosses the Mau Plateau at 8,300 ft. The plateau itself carries a good deal of forest, but there are many short-grass plains and grass glades in the forest suitable for landings. During and after the long rains (May, June and July), clouds often rest on the top of the plateau in the early morning, but invariably clear later in the day.

East of the Mau Summit the ground falls away rapidly to the Rift Valley (Makuru and Naivasha) at 5,000 to 6,000 ft. The Rift Valley and much of the surrounding country, east and west, is volcanic, and therefore often rough; the floor of the valley is in places covered with bush of a very open type, but is generally grass, and provides an abundance of good natural landing grounds.

The eastern escarpment of the Rift Valley (Kijabe) attains an elevation of 7,500 ft., and, from its summit, it drops away over a series of very rough ridges and closely settled country to Nairobi at 5,500 ft. Below Nairobi, to the east and south for many miles, stretch the Athi Plains (Game Reserves) grass covered and slightly undulating, providing natural landing grounds everywhere, except during the rains, when care has to be taken to select the tops of the ridges to avoid the worst of the black cotton soil, which makes the plains impassable by car.

East of the plains, and stretching from Magadi Junction to within 15 or 20 miles of Mombasa, is the dry arid bush region inhabited, for the most part, by neither native or white man. Sections of this consist of rocky volcanic hills and boulders, but the selection of sites of unlimited level dimensions, and requiring only the clearing of dry bush to make perfect landing grounds, presented no difficulty. The elevation falls gradually from Nairobi to Mombasa, where the final drop of 700 ft. is over a steep ridge running parallel to and a few miles from the coast.

The *Nairobi-Dar-es-Salaam* route starts over the Athi Plains, crosses some hilly, savannah country in the south of Kenya, and emerges on to other grass plains to the north-west of Kilimanjaro. It crosses the low saddle (3,000 ft.) between Mt. Kilimanjaro (19,000 ft.) and Mt. Meru (14,950 ft.) to Moshi, which lies at the southern base of Kilimanjaro. This part of the route is an alternation of open bush and grass plains. Practically the whole of the route from Nairobi to Moshi lies over the Masai native reserve. The Masai at one time a warlike race of cattle herders, now have the former part of their energies restricted to lion hunting.

A meteorological feature of some importance, which is equally shared by Arusha on the main north-south route, is that local rain and low cloud are induced in the early morning by the two mountains, and these clouds, apart from the heavy nature of the rain, may prevent flying over the surrounding ridges and spurs down to about 3,000 ft., until the middle hours of the morning.

From Moshi to Dar-es-Salaam the route has not been fully explored. It follows the Tanga railway to the neighbourhood of Korogwe, the first part of this section lying over dense bush, of which most of those who took part in the East African campaign will have painful memories. Flanking the route on the north-east side of the railway are the Pare and Usambara Mountains rising to a height of 7,000 ft., the general level of the country dropping from 2,500 ft. to 1,000 ft. In the later half there are many important sisal plantations and derelict rubber plantations started by the Germans. In most parts one may find open grass flats, locally known as mbugas (Rhodesian-dambo), which in the dry weather provide good landing places, but which during the rains are swamps.

Leaving the railway at Korogwe, the route again lies over rather desolate bush country, and emerges on to the coastal fringe of palm trees and cultivation at Saadani. A suitable aerodrome site has been selected at Dar-es-Salaam, and has already been partly prepared.

The *Nairobi-Mbeya* route branches from the Dar-es-Salaam route at Longido, which, until there is a full customs union between Tanganyika and Kenya, may be an examination station. Thence it passes over bush plains and open grass plains and downs on the north-western and western flank of Mt. Meru, to Arusha on the south-west flank. Arusha is an important and growing centre of white settlement (coffee growing), and incidentally with its flowers,

crystal streams and forest trees, backed by the magnificent mass of Mt. Meru, may claim to be one of the most attractive spots in East Africa.

South of Arusha, which will shortly be the terminus of the Tanga railway, now running only to Moshi, lies a purely native region (Masai), consisting of grass plains and bush plains interspersed with mbugas, and flanked on the west by sundry escarpments and isolated peaks reaching 10,000 ft. and forming the eastern wall of the Rift Valley. The route itself does not normally exceed a height of 4,500 ft., and drops to 3,700 ft. at Dodoma on the Central Railway, the last 40 miles of this section being fairly thick bush.

South of Dodoma the route first passes over rather broken country, but later emerges on to the great bush plain lying at an altitude of about 3,500 ft. to the west of the Iringa Plateau. Through this bush plain runs the Great Ruaha River, having its origin in the Poroto Mountains at the head of Lake Nyassa and flowing in a northerly then north-easterly direction round the northern end of the Iringa Plateau. The whole of this plain is comprised within the arid region referred to as an extension from the Northern Frontier Province of Kenya, and the dry region lying between Nairobi and the coast. It is, in consequence, very sparsely populated, and entirely devoid of white settlement. The hard, sandy nature of the plain and its dry thorn bush covering is such as to make it easy in most places to prepare landing grounds at low cost, except for the dearth of local labour.

The route might reach Mbeya entirely over this plain without crossing the Iringa Plateau, which has a general elevation of 5,000 to 6,000 ft., with isolated peaks of 8,000 ft. in its northern part. To do so, however, would mean constructing landing grounds in country entirely devoid of communications, since the main road climbs on to the plateau north of Iringa and follows it throughout its whole length; the route would thereby also miss the whole of this developing region. The top of the plateau, whose characteristic natural vegetation is myombo forest, is considerably more difficult from the point of view of the construction of landing grounds than the plain. Where grass occurs in the south part of the plateau, a disconcerting feature in a forced landing is the universal presence of a small type of ant heap at close intervals, not more than 9 in. high and entirely invisible when the grass, which is not long for African grass, is standing

The white settlement area does not start until about 30 miles south of Iringa, and it is developing mainly in a southerly and south-easterly direction. It is still, however, in a very primitive state of development.

Between the southern flank of the Iringa Plateau and the Poroto Mountains, which, with the Livingstone Mountains and the Bundali Hills, surround the northern end of Lake Nyassa, lie the notorious Buhora Flats, an extensive region which becomes an impassable swampy lake in the rains, for some four to six months in the year, and thereby cuts off Tukuyu and the settlement areas in the south, with Rhodesia, from the rest of Tanganyika. A new road is now being constructed round the flats.

Mbeya itself lies in a wide grass covered valley between the Poroto Mountains on the south and the Mbeya Mountains on the north, both rising to 10,000 ft. 5,000 ft. above the valley. After crossing the Buhora Flats and climbing the pass to the valley 1,500 ft. above, the impression is that of a gateway to Rhodesia and the lands beyond—a rather striking natural feature. The floor of the valley is in many places a natural landing ground, requiring only the burning of the long, wheat-like grass as preparation. A very fine site for a landing ground was found near the Boma, and this, as the customs aerodrome in the south of Tanganyika and a possible night halt on the main route to the Cape, is likely to become of some importance. A further point of interest about Mbeya is that it is the jumping-off point of the mountain track to the Lupa goldfields to the north. These at present are limited to small scale placer mining, but, with the discovery of a reef, the area is attracting the attention of the South African mining groups, and may become of considerable importance.

With these three main air routes prepared, and a few additional landing grounds at other centres of settlement in the Kenya Highlands, such, for example, as Eldoret, Kitale and Nyeri, it will be possible to travel by air between all the important centres in East Africa.

Other Internal Routes

It only remains to mention certain other possible routes of the future. With the exception of one, they all have the Belgian Congo as their objective. The exception is a seaplane route along the coast, connecting Mombasa, Tanga and Dar-es-Salaam, with probably an extension south to Lindi, Mozambique and even Beira and Durban. The coasts of Kenya and Tanganyika, with their numerous land-locked harbours and wide river estuaries, are admirably adapted for this purpose. The commercial population of the coast is keenly alive to the possibility of this development, and steps have been taken to select sites, with a view to reservation, at the three ports mentioned.

The possible extension from Entebbe or Tororo in a north-westerly direction through the Northern Province of Uganda to the Kilo-Moto mines area has already been mentioned. Secondly, there is a route along the Tanganyika Central Railway to Kigoma on Lake Tanganyika with a view to connecting up with Albertville and the Katanga region of the Congo. The nucleus of this is being laid by a chain of emergency landing grounds along the railway, now in preparation for the operations of the Avro Avian purchased for survey work by the Survey Department of Tanganyika. Thirdly, there is a possible route to the new Belgian provinces of Ruanda and Urundi, now being developed as a white settlement area with tourist hotels and aerodromes by a Belgian syndicate. This region may be reached in a north-westerly direction from Mwanza in Tanganyika, or in a south-westerly direction from Kampala in Uganda. In the latter case, the terrain to be crossed is not very favourable, and there are some formidable mountain masses (8,000 to 9,000 ft.) in the south-west of Uganda.

In Uganda it may be noted there are many small lakes, as well as the better known lakes, which are suitable for the operation of seaplanes. This applies particularly in the mountain region of Kigezi in the south-west and to a lesser extent in Ankole. A map of Uganda, however, gives an unduly favourable impression of the possibilities, since one finds that the lakes and broad lake-like rivers are mainly choked by the ubiquitous papyrus.

Aero Clubs and Internal Flying

Aero Club of East Africa.—It is to be expected that East Africa, with its peculiar type of white settlement, would not lag behind in the matter of private flying. In July, 1927, the Aero Club of Kenya was formed as an association of ex-members of the flying services and others interested in aviation. With the spread of interest in 1928 (the membership having reached 300), the name was changed to the Aero Club of East Africa, and branch organisations were established in Entebbe and Dar-es-Salaam. The club is affiliated to the Royal Aero Club, and proposes to foster the development of flying clubs. Proposals to this end have been made to the Government of Kenya. Owing to the more scattered nature of the settlement in Tanganyika and the different line of development of Uganda, these club activities are likely for some time to be restricted to Kenya.

Pioneers.—To the growth of interest in aviation, the numerous aviators who have now flown along the Cape route have all contributed their share; and here is an example of how the existence of facilities for flying in the shape of a chain of landing grounds, kept open, more or less, since 1920, has produced a certain commercial result, which is likely in the near future to be very much larger, with the extension of facilities in the shape of suitably placed landing grounds.

In this development, one must pay tribute to the work of Mr. John Carberry, who, with his two flights to Nairobi and various "taxi" flights in Kenya and Uganda, has done much to familiarise the Kenyans with aviation, and to dispel the idea that there is some peculiar and unexplained obstacle to flying in the East African atmosphere. The late Mrs. Carberry's unprepared flight from Mombasa to Nairobi (300 miles) over desolate bush country, in 3½ hours against 15 by train, also did much to show the possibilities.

There are now in Kenya 2 Moths, 1 D.H.51 and 2 Klemm Daimlers (not now flying), and an addition will shortly be made by the presentation light aeroplane from Sir Charles Wakefield to the Aero Club of East Africa: Mr. Carberry's Fokker Universal is back in England after its second return flight to East Africa; in Tanganyika there is one Avian belonging to the Survey Department.

Taxi Work and Schools.—This number of aircraft, will, I believe, rapidly increase when facilities exist for training the considerable number of people who have contemplated owning their own machines and thus bringing their isolated farms into closer touch with the business centres.

While there is this nucleus of prospective owners, there is a far larger number of people who would make occasional use of an aeroplane for business journeys. There appear to be good prospects, therefore, for a taxi organisation. British East African Airways, Ltd., with Lord Delamere at its head, has been formed to develop these activities.

The market for light aeroplanes and a "taxi" type of aircraft in East Africa appears worth the attention of British manufacturers.

Air Survey, Crop Protection, etc.

In such a vast territory as the British Empire, one is apt to forget the enormous areas of potential wealth, which are not only entirely undeveloped but virtually unknown. One of the greatest obstacles to development, and more particularly right development, is lack of maps. Wrong development has cost the British Empire (and equally other countries with lands to develop) uncounted millions. More and more the attention of surveyors is being concentrated on the possibilities opened up by air survey of obtaining quickly the data necessary for the sure and certain development of these new lands, and of reversing the old established order of development first, survey after.

Economic Surveys.—It is not only survey in its strictly limited sense of topographical or other measurement surveys which is involved. The development of new territory demands a complete economic survey on which to lay out the plans. To obtain this by ground survey involves years of labour even for a limited area, and the result then contains a great deal of interpolation. There is now ample accumulated proof from the work of the two British air survey companies in various parts of the Empire, and the work of the Royal Canadian Air Force and Topographic Survey Department of Canada, that an air photo survey properly interpreted will provide data on practically every subject involved.

Agriculture.—The Department of Agriculture, by a comparative study of the types of vegetation recognisable on the photographs, obtains information as to the suitability of the soil for various kinds of crops.

Geology.—The geologist, by the same evidence, is informed as to the particular surface formation covering an area and the position of the boundary between two formations. He has also the additional evidence of outcrops useful in prospecting for certain types of minerals. In addition, he has the peculiar superimposed effects in certain condition of particular mineral deposits such as copper and oil. All these are recognisable with much greater precision and ease on an air photograph than it is possible to achieve by ground observation in thick, or even moderately open, bush. The features, too, are much more precisely recognisable, whether from the air or the ground, in virgin territory such as Central Africa, than in more civilised countries where the hand of man has wrought artificial changes.

Forestry.—The Forestry Department obtains from the photographs, not only the areas and boundaries of the forests, but the types of timber contained in them, from which an estimate of their marketable value may be formed.

Road and Railway Location.—The road engineer and the railway engineer obtain preliminary information as to the best line for new roads and railways, in reference both to the economic factors already mentioned and the contours of the land. The latter can be developed, as required, to give more precise contours for the final determination of the track. One might instance a railway in West Africa as an example, which, owing to an incomplete original survey, was ultimately rebuilt on a new route at a cost of nearly £1,000,000; and the main road to Rhodesia in the south of Tanganyika, which crosses the winding Little Ruaha River no less than four times and finally picks its way over the often impassable Buhora Flats—a new route now having been found which, by a 100-mile by-pass, cuts out all these things.

Topographic Survey.—Finally, from the photographs combined with the necessary measure of ground control may be made up the topographical maps necessary to anyone finding his way about the country.

All these can be done with greater or less accuracy, to meet the needs of the case, with corresponding variations in the cost, while the photographs remain available for the production of maps of greater accuracy as required at a later date. It is often not realised that, in the early stages of prospecting or development of a country, supreme accuracy is not required, and that good local accuracy is a more valuable feature than precise position. In other words, maps with good topographic detail may sometimes usefully precede the elaboration of more than the minimum of triangulation.

This, roughly, is the scope of the type of survey which promises to be most useful in East Africa. A detailed list of the various areas in which air survey might be used is unnecessary, but some of the more important will give an idea of the scope:—

Opportunities for Air Survey in East Africa.—Development surveys for European settlement in the Masai district of Tanganyika and in the highlands of the south; road survey for a new north-south road connecting Kenya and Uganda; railway survey for the extension of the line to the Congo border; geological reconnaissance in Kenya; forest surveys of limited extent in all three territories; Tana river prospective rice growing land; and crop surveys in Kenya.

Sudd Survey.—The most important prospective item of air survey in this part of Africa lies outside the limits of British East Africa, in the Sudan. Here the Egyptian Government plans for a canal through the Sudd to conserve the waters of the Nile, linked with the scheme for a dam across the mouth of Lake Albert, involve problems of survey which, owing to the nature of the terrain, present great difficulties to the ground surveyor. The introduction of an air survey organisation to deal with this area will go a long way towards making it economically possible to deal with with the other areas in East Africa, which are not sufficiently important in themselves to warrant the high overhead costs of a special expedition.

The difficulty of financing the more rapidly completed air survey is an obstacle here as elsewhere, but it is significant that the Hilton Young Commission, in drawing attention to the very large number of surveys required for development purposes, particularly in connection with railways and settlement in Tanganyika, stresses the fact that the survey resources of the territory are insufficient to deal with the problem sufficiently promptly, and advises the authorisation of loan expenditure to meet the cost.

Crop Spraying.—A survey organisation in East Africa would find a certain amount of work to do in the way of crop spraying, though a special expedition for this purpose would not, in present conditions, be justified. Thinking of

East Africa as an agricultural country of wide spaces, one is inclined to expect rather more scope for this type of work than actually occurs.

Coffee, which is the principal crop of Kenya and parts of Tanganyika and Uganda, grows in the highlands, usually in relatively small areas, and almost invariably in very broken country difficult for aeroplane spraying operations. Coffee is not at present attacked by any pest which is susceptible to surface spraying.

Cotton, the principal crop of Uganda and parts of Tanganyika, is entirely native grown in very small plots entirely unsuited for treatment by aircraft. The system of cultivation which makes it unsuitable for aeroplane treatment makes it easy to apply the more drastic method of burning infested crops, which is now enforced.

Sisal, grown largely in the lower lying level areas in very large plantations, ideally adapted for aeroplane spraying, appears to be impervious to any pests.

Maize, a rapidly increasing crop in Kenya, is attacked by the mealy bug, which, however, buries itself in the cob and cannot be reached by surface spraying.

An opportunity for experimental attack by aircraft did present itself in the very serious locust invasion of Kenya, which took place in 1928 and the early part of 1929. While it should be possible to do valuable work with aircraft in a locust invasion, the technique of attack has certainly not been developed to the point where any certainty of success can be promised.

Control of Flying

The International Convention for Air Navigation applies to British Possessions by virtue of the signature of Great Britain. Certain sections of the Air Navigation Act of 1920 were applied to the Crown Colonies and Protectorates by the Air Navigation (Colonies and Protectorate) Order in Council of 1922. In 1927, the Air Navigation (Colonies, Protectorates and Mandated Territories) Order in Council, 1927, applied many of the detailed provisions of the home Order in Council to the Colonies, etc., while it left to the Governor discretion on many points, which might be affected by varying local conditions, and gave him power to make directions to amplify and give full effect to the terms of the Order in Council.

Air Navigation Directions.—In 1928, directions were drafted in Kenya, Uganda and Tanganyika, and in Kenya they were put into force. They are drafted on somewhat similar lines to the British Air Navigation Directions. The main differences in the Order and Directions from those in force in Great Britain are :—

(1) Type Certificate of Airworthiness.—No provision is made.

(2) Periodical Inspection.—For the 24 hourly inspection of aircraft flying for hire or reward is substituted a weekly inspection, except in the case of aircraft operating on a regular service.

(3) Pilots' Licences.—"A" licences only may be issued by the Governor; "B" Licences may be renewed.

The Directions are drafted on fairly comprehensive lines, and contain provision for the temporary relaxation by the Governor of any of the conditions where it is clear that local conditions make it impracticable to carry them out. This course was considered preferable to establishing a lax system to fit the existing facilities for control in a Colony, with the inevitable necessity of tightening up the system later on.

Air Board.—An Air Board has been established in each territory to advise the Governor on matters of principle and policy arising out of the regulations. While the Board may have a permanent existence, its avowed purpose is to distribute the responsibility which would normally be borne by a special department having experience of the administration of aviation—until such a department is justified. The Board consists of the heads of those departments having some interest in aviation, headed by the Colonial Secretary or Chief Secretary.

A Registrar has been appointed as provided in the Order, and his functions will include all the routine business of administration.

Function of the Aero Club in Control.—Use is being made in Kenya of the Aero Club of East Africa in a number of ways. The club has been appointed provisionally as a technical advisory body to the Air Board. It has undertaken the examination and testing of candidates for "A" licences. Two of its representatives with previous experience are being instructed in the methods of aircraft inspection, with a view to carrying out this duty, and recommending to the Air Board the renewal of Certificates of Airworthiness. A subsidy has been granted to the Aero Club by the Government of Kenya to enable it to employ a qualified ground engineer, who will be available for the "signing out" of any aircraft requiring it. His headquarters will be in Nairobi, and his duties will include the management of the new Nairobi aerodrome. In addition to this, arrangements have been made with the Kenya-Uganda Railway to find posts for two other mechanics with ground engineers' qualifications. These will be available for spare time work on aircraft. It will be possible, therefore, for aircraft operators who cannot afford to employ ground engineers of their own, to have their aircraft inspected at the intervals required by the regulations, and, at the same time, the path of the private owner in the matter of overhauls and repairs will be greatly smoothed.

Special Conditions

Having now surveyed the field, we may review briefly the special conditions which aircraft operators have to face in East Africa. With the advance in aeronautical design and the technique of aircraft construction which has taken place since the war the problem of operation in the tropics is not such a bugbear as it was. Certainly to-day there is no excuse for that legacy of the war, the belief so widely held that there is something peculiar and mysterious in the conditions in East Africa, which makes it impracticable to operate aircraft satisfactorily or even safely. No better proof to the contrary is needed than the constant stream of "Moths," "Avians," and bigger craft flitting up and down to the Cape apparently quite normally, though actually, we know, lacking some of their home performance.

Temperature.—Data concerning temperature, humidity and pressure are given in the section dealing with climatology in this paper. It will be seen that no conditions of extreme temperature have to be faced. While freezing temperatures are sometimes experienced in the highlands, a temperature of 100° F. may be looked on as the normal upper limit. This, however, is sufficiently high to affect the take-off and landing run adversely.

Humidity.—While conditions of extreme humidity are only met with on the coast and to a lesser extent around the lakes, *e.g.*, in Uganda, it will be seen that in the dry season conditions of extremely low humidity may be encountered, and are normal in such regions as the Northern Frontier Province of Kenya. Aircraft may therefore be subjected to both conditions alternately—probably the worst conditions for wooden aircraft. Shrinkage and warping of spars, ribs and longerons, with the attendant slacking off of fittings, is a serious item of maintenance in a dry climate. If to this is added a periodical subjection to moist conditions, a further detriment to the use of wooden aircraft is introduced, particularly where glued surfaces are concerned. The more serious of the two factors, however, appears to be the dry condition, owing to the change in strength factors of the timber on loss of water content.

Pressure and Height.—The whole of East Africa lies within the tropical low-pressure belt, but it has been shown that the variations of pressure at any place are extremely small. Pressure is therefore practically a function of height, and this, it is abundantly clear, is an all-important factor in East Africa, affecting as it does the performance of an aircraft in take-off, landing run, climb and speed. Nairobi, at a height of 5,500 ft., has been given as a typical example with a minimum relative density of ·81. While this expresses sufficiently well the normal condition in the highlands, more extreme conditions are met with, for example, on the Uasin Gishu Plateau (Eldoret and Kitale) where the altitude is 7,000 ft., and other isolated places where operations may have to be carried out at an altitude of 8,000 ft. As far as possible, the increased take-off and landing runs are being allowed for by increased size of landing grounds.

From a recent investigation of the effect of low-pressure and high temperature on the take-off and landing run of aircraft carried out by the Royal Aircraft Establishment, it is calculated that the increase in run required by a normal aeroplane at Nairobi in the dry season with a temperature of 90° is as follows :—

	Increase per cent.
Take-off run	50
Landing run	23

Severe dust devils and smoke from bush and grass fires are referred to under "Climatology," and need only be mentioned here as special conditions.

Insect Pests.—A much feared enemy of the wooden aircraft, without much justification, is the white ant. The white ant occurs in different forms in the whole of Africa, from the southern Sudan to Rhodesia. He is, in all cases that I know of, a timber borer, but the important fact which is usually lost sight of is that he does his work under special conditions. He loves darkness, comes out under cover of night or twilight, and, in attacking a tree or a post, builds tunnels of mud along the ground and up the trunk of the tree. A whole forest of trees may be encountered, stained to a height of 10 ft. from the ground with the deep rich red of the laterite soil, carried there by the white ant in his operations. The process is slow, and it is not until a house is left unoccupied for a considerable period that the white ant invades it and does the damage to furniture, trunks, etc., which makes him so much feared. To a normally maintained aircraft, therefore, the white ant is not a factor to be very seriously considered.

The habit of the white ant of building ant-hills which vary in size and shape from the giant hills 15 ft. high found in Rhodesia, to the small mole heap type found on the Iringa Plateau, and the strange chimney formations found in the southern Sudan—this habit is much more a danger to aircraft than his timber boring propensities. Fortunately it appears that when ant-hills are continually destroyed, and particularly when the destruction goes below ground level and the queen is disturbed, the ants forsake the nest, and a continuously maintained landing ground, therefore, costs successively less each year to maintain on this account. The same thing also applies to the growth of bush on a landing ground, which is continuously cleared.

The white ant is not the only boring pest to be considered. The borer beetle is common in the southern Sudan and northern Uganda. His ceaseless activities in the wooden beams of one's grass banda may be listened to all night, while periodically he ejects a fine stream of wood dust on to one's face through the minute hole by which he enters the beam. His efforts result in quite a short space of time, in an outwardly sound piece of timber, which is completely hollow inside. Again, the conditions of his working are much more likely to attract him to the wooden frame of a hangar than to the wooden members of an aircraft frame.

Cases are not unknown where the propensity of the innumerable bees of the country for nesting in small holes have attracted them to the pitot tube of an aeroplane, with disconcerting results for the pilot. It is a good rule to stop up the pitot tube when the aircraft is on the ground, not forgetting the precaution of tying a red rag to the stopper, in case the cure should be as disastrous as the disease.

The prolific life of the mangrove swamps of the seaboard of East Africa suggests that additional precautions to keep the floats and hull bottoms of seaplanes clean and protected will be necessary.

Special Type of Aircraft Required

While in East Africa, as elsewhere, different types of aircraft will be required for different types of work, one or two points may be brought to the notice of designers.

The climatic conditions suggest immediately the desirability of all metal construction in place of wood.

The high altitude of operation calls for some increase of power in the normal light aeroplane, to give it approximately the same carrying capacity and performance.

The large areas of bush to be flown over point to the desirability of the three-engined aircraft, even in small sizes, to give absolute freedom of flight over the whole country with comparative safety.

Taking into account the economic features, the most useful type of machine for which there should be a demand in the near future, is a cabin machine for four passengers with baggage space. The machine should be fitted with three engines, and on account of the high altitude of operation should be designed to fly on any two engines at 7,000 ft. without loss of height. It should have a cruising range of about 300 miles in still air. Such a machine appears to be one that will meet with a demand in all colonies or similar partially developed countries, and it is good to note that the type is now receiving the attention of British designers.

With such a machine one of the last obstacles to aircraft operation in East Africa—high or prohibitive insurance rates—should largely disappear.

Closer Union Commission Report

While the Closer Union Commission did not specifically study aviation in relation to the development of the East African territories, their report is a document of such far-reaching importance in this connection that it is worth while quoting in conclusion their main reference to the subject, as showing the probable trend of development :—

> "Great possibilities for the future of communications as a help towards administrative union lie in the development of air routes. A service of communications by air cannot be organised save by the common effort, administrative and financial, of all three territories."

I am indebted to Mr. S. G. Champ, of the Air Ministry, for very great help in the preparation of the material, diagrams and slides used in this lecture.

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Change of Address

BURCH'S, the well-known R.A.F. tailors, have had to move to new premises, owing to alterations in the Strand, where, at No. 401, they have been established for over 40 years. They have now removed to more modern and commodious premises at 33, Bedford Street, W.C., right opposite the Post Office. We trust "FLIGHT" Readers, Service and Civil, will note this change.

EDDIES

THE designs of those new commemorative stamps have received from philatelists—and others—a sound drubbing, and assuredly they are hardly beautiful, to put it mildly. That, by the way; but considering our King is such an ardent philatelist himself, it would have been a happy opportunity had the occasion also been marked by an air-mail stamp or series, so very long now overdue. But presumably His Majesty's state of health precluded his being bothered in the matter.

IN this connection a *Times* correspondent asks could there not be a really picturesque series of stamps issued to commemorate the recovery of the King, these to also help the hospitals. The idea is a splendid one and should prove popular throughout the world. Might I go further and say by *also* making the series an air-mail issue, the sale would be such as to probably bring directly home to the millions of British subjects in a practical form the use, speed and value of using the air-mail regularly and thus establish it upon a sound paying basis—a remunerative advertisement scheme indeed.

APROPOS these new stamps, as an indication of the official mind, it is illuminating to note that the Postmaster-General, Sir William Mitchell-Thomson, immediately following the issue of this Postal Union Congress Commemorative series, gave public utterance, after saying it was a common charge that in this country we were slaves of tradition, to the statement that on no occasion in the 89 years since the postage stamp was first introduced (by Great Britain) had a special issue of postage stamps ever been made for general use in this country. (The Wembley Exhibition issue was obtainable at the Exhibition only.)

WHAT a hide-bound record to boast about! If in other directions the same psychological Rip-van-Winkleism had been persisted in and been deemed praiseworthy to remain stagnant for 89 years, I'm just wondering what the world generally would now be like—a world of heroes possibly—one for somnolent Postmaster-Generals, decidedly—no "blessings" (?) in the form of telephony, motor cars, wireless, flying, poison gas, the dole, jazzing, short skirts, cocktail parties, and what not! That such a thing as the benefit of judicious publicity has reached the mind even of a P.M.G.—our P.M.G. set forth that "the present special issue would be a most effective and unique method of bringing before the public in this country and any other country . . . the importance *we* attached to the meeting of the Postal Union in our midst. One of the really important advantages of a meeting of this character was that it brought together the heads of the Postal Service in every country."

NOW we've got it! It's official hob-nobbing which counts—not to help forward general air-mindedness. Let help to an important future Empire asset go hang—even if it not only does not cost the country a cent, but rather the reverse, a swingeing profit probably resulting—so long as officials are pleased with each other. Let's hope some of the delegates will ram home upon our red-tape organisation, that there is something quite good *and* tangible in a scheme for an air-post series of stamps. To be hoped, though, it will be done officially for record, as you never know who the next office filler may be, and of course it would be a shocking *faux pas* for any official to leave any hints of what he may have learnt in wisdom for the guidance of his successor. Hey, ho!

"The Pilot who *couldn't* miss it!"

QUITE a graceful act is in course of arrangement in Canada in the celebration, on June 14, 1929, of the tenth anniversary of the first non-stop Atlantic flight from Newfoundland to Ireland by Sir John Alcock and Sir Arthur W. Brown. The event is in the hands of the Imperial Order Daughters of the Empire and is to be a National effort. Lest this great adventure be forgotten, moreover, the name Alcock, for a mountain in British Columbia, has received the approval of the Geographic Board of Canada; the Canadian National Railways have allotted the same name to a station; and several post offices and stations carry the names of Brown. To show there is no prejudice, Lindberg now attaches to an Alberta post-office and a lake in Ontario.

THE occasion is also to be marked this side, the Chairman and Directors of Vickers (Aviation), Ltd., and Rolls-Royce, Ltd., celebrating at a luncheon at the Savoy, the anniversary when machine and engine, as well as the pilots, should have their full meed of praise for this historical event.

A FELLOW-FEELING makes one wondrous kind and it looks as if the human and helpful treatment of the Graf Zeppelin and its occupants by the French Government and generally, is likely to quickly create more good feeling between the two nations than months of guarded and reserved

diplomacy could every have accomplished—in which event, it is a case truly of out of evil (disaster) cometh good.

SPARKS, not only the machines, may be expected to fly N.S.A. way, in the aeroplane manufacturing world, now that General Motors Corporation are reported to have acquired a controlling interest in the Fokker Company. It is freely claimed that this is but another stragetic move against their motor rivals, the Ford Company, who have been firmly establishing themselves in aviation.

STEALING parts of a crashed 'plane by ghoulish souvenir hunters, as alleged in connection with the greatly regretted crash of Capt. Schofield, is not only the shameful act of erotics, but its iniquity in thereby eliminating tangible evidence which may go towards discovering the why and wherefore of the accident is worthy of the infliction of a drastic term of imprisonment for the perpetrator or perpetrators of such an outrage. Possession by "finding' is a criminal and punishable offence. How much more so is such an annexation by some unnatural and morbid creature?

GLIDING experiments in England must needs wait awhile, according to Sir Philip Sassoon, so far as Government financial assistance is concerned, as Sir Philip rightly suggests that it would hardly be possible to find funds for this purpose without diverting them from other more essential services. Sir Harry Brittain, however, would have it otherwise, as he sees in gliding the valuable lessons which may be learned, and therefore pleads for official encouragement for this side of air "navigation."

HOW methods change with the times—Aeroplanes were again to the rescue in Canada where trains were helplessly snow-bound, passengers, officials all in. Such is the recent story to hand from Winnipeg where an unprecedented blizzard had marooned about 300 humans in North Manitoba some 400 miles N.W. of Winnipeg. Aeroplanes plus horse and dog sleds went with food to the rescue and so set the hearts of the almost starving people rejoicing.

MR. H. R. MURRAY-PHILIPSON, one of the most enlightened and up-to-date members of the House, has put the case for the aeroplane briefly as follows: "When I find I cannot get a crowd, I shall just drop from the clouds and get a good gathering. My constituency is one of the largest and most difficult in Scotland. It comprises 600 square miles in two counties, and therefore I shall make full use of my aeroplane, which I use here just as I would a motor-car."

THE art of flying has surely entered the poetic realms, judging by the following characteristic and almost idyllic pæan of praise, which appeared in the *Mail*, from the Hon. Ruaraidh Erskine, of Marr. Thus does he, from Aboyne, give voice to his desire for an "airman's emblem":—

"Surely the great and growing world of aviation should have its own emblem, a sign and symbol common to all who go up to the heavens in ships made with wings?

"I venture to suggest as emblem for aviation the beautiful narcissus.

"He who looks at the narcissus will apprehend at once the appropriateness of this suggestion. The narcissus is the propeller of an airship made by nature, as it were. The flower is shaped exactly like that object; and, further, white as the narcissus is, scarce less so are the blades that propel the aircraft heavenwards.

"Everyone knows the beautiful myth of Narcissus. The youth was desperately wooed, but would not yield to love. He was 'too proud' to love.

"It is the same with this lofty science of aviation, whose realm is not of earth or on earth, but in the heavens that float above it."

DR. VILHJALMUR STEFANSSON again emphasised his views upon the ease and importance as an ideal flying route, of the Conquest of the North the other day at a gathering of the American Chamber of Commerce, where he was the guest of honour. In fact, he happily and enthusiastically named the Arctic Circle as the "Piccadilly Circus" of flying, Canada being a natural flying route. Irrespective of its apt naming, the spot is particularly appropriate having regard to the "winged" Eros which one time dominated this great hub of traffic, and which some day is—let us still hope—to resume its central place of honour. The opening up of Stefansson's short route to "Cathay" and the Indies—one of the great dreams of England 75 years ago—via the Arctic Circle might well, when seriously installed, take for its "emblem" the winged God of Love. Sir Sefton Brancker, back again from his Greek visit, backed up the doctor's views of the real commercial route between the New and the Old World. Dr. Stefansson is not one to be lightly put off, as witness his past world-benefiting achievements; therefore, it may well be that all in good time his pet project in this direction will materialise, again to the gain of the earth's inhabitants.

IT is possible that the old-time Fenimore-Cooper Indian is gradually becoming extinct, but that there is an appreciation of modern civilisation and progress still left in those remaining of the breed gives reason to wonder why there should not be a long survival of this ancient race. An instance of the alertness of the Indians—an alertness that may well serve as an example to more "enlightened" white men—is towards in the announcement that four Indians of Alaska recently, to save time, chartered an aeroplane to carry them to Wolfe Lake, North British Columbia, 150 miles distant, the journey occupying under two hours.

AEOLUS.

["FLIGHT" *Photograph*

A Good Beginning: The little single-seater mono-plane with A.B.C. "Scorpion" engine, produced by Henderson and Glenny, and to which we referred recently, established a world's record last week by reaching a height of 10,400 ft. (uncorrected), piloted by Col. Henderson. Standing in front of the machine are, from left to right, Col. G. L. P. Henderson, Mr. K. N. Pearson (designer), and Mr. Glenny. Experiments are to be made shortly with wings fitted with the Pearson type of lateral control.

THE ROHRBACH "ROLAND II"

Improved Version recently Completed

THE Rohrbach Metall-Flugzeugbau of Berlin has just completed a "Roland" three-engined commercial monoplane in which a number of improvements suggested by the experience of the Lufthansa have been incorporated. Like the older type, the latest version is destined for use on the German air routes, and although definite performance figures are not yet available, it appears that, in spite of a greater capacity, the new machine has suffered no reduction in performance compared with the "Roland I." The latter, it will perhaps be recollected, is the holder of no less than 22 world's records.

It is not proposed to give here a detailed description of the new machine, as it is assumed that the reader will be fairly familiar with the older type. We shall confine ourselves to giving an outline of the changes and improvements that have been incorporated in the latest version.

The most important change, from the point of view of the passengers, is the widening of the cabin space. This has been accompanied also by an increase in the height of the cabin, and as, furthermore, the wing has been raised so as to avoid running the centre section through the cabin, as it did in the older type, the comfort of the passengers is now considerably greater.

The pilot's cockpit of the new machine has been lowered so as to conform more to the general fuselage contour, and as the nose engine has been lowered, the view forward is still good without the raised cockpit, which rather disfigured the "Roland I." The windscreen has been re-designed.

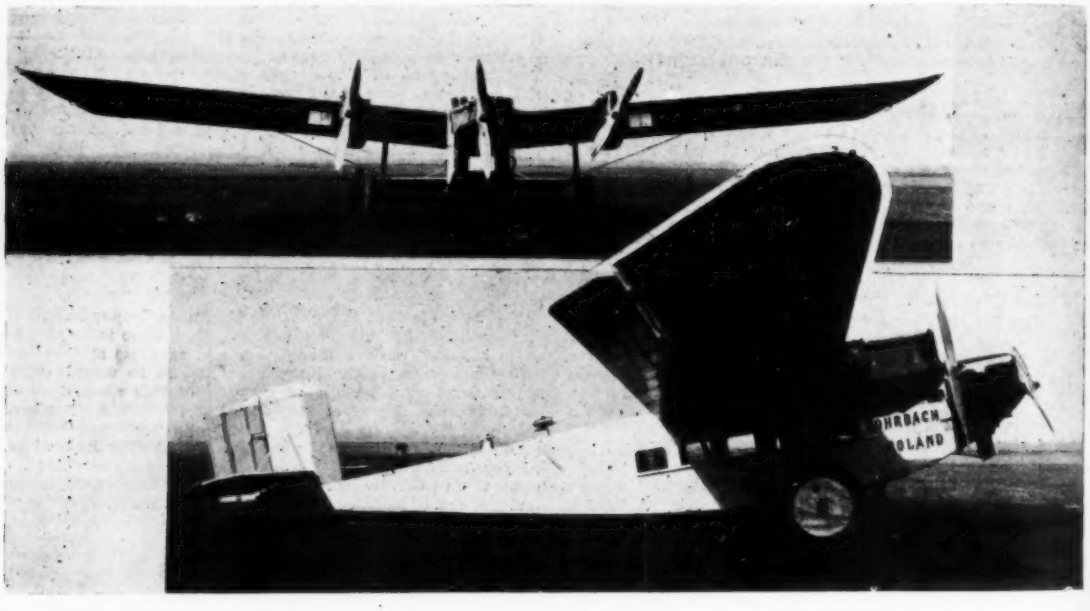
The tail of the "Roland II" has been re-designed, and now rests entirely on top of the fuselage, the main structure of which has been extended rearwards. The control surfaces, cables, etc., have thereby become more accessible for inspection and maintenance. Ball bearings have been substituted for the plain bearings previously used.

In the arrangement of the controls and control rods, improvements have been effected by the substitution of cranks for the sliding bearings, and non-magnetic metals such as electron and silumin castings have been employed wherever possible so as to avoid as far as possible interference with the compass.

In the undercarriage all ball-and-socket joints have been replaced by universal joints having grease-gun lubrication, and the fairings of the undercarriage struts are no longer made of wood but of electron.

The power-plant arrangement has undergone modifications resulting in improvements in aerodynamic efficiency as well as in greater reliability of installation and better accessibility. The wing engine housings have been redesigned to give better aerodynamic form and better ventilation. The radiators have been transferred to a position outside the engines, and in the case of the central engine the radiator has been placed below the fuselage. All three radiators are now alike, and are mounted in accordance with the method specified by the German Luft Hansa.

The petrol tanks, housed inside the wing, have been increased in number from 8 to 10, whereby the petrol capacity has been increased from 1,350 litres (297 galls.) to 1,550 litres (341 galls.), and the petrol pipes have been so arranged on the outside of the fuselage that in case of a breakage no petrol would get into the cabin. All oil tanks are now placed behind the fireproof bulkheads, and Minimax fire-extinguishers have been installed. The fireproof bulkhead behind the central engine is now made of non-magnetic steel to reduce interference with the compass.



THE NEW ROHRBACH "ROLAND": Two views of the improved machine recently produced. A larger cabin and cockpit and better engine installation are features of the latest type.

As already mentioned, detail performance figures are not available, but preliminary flying tests indicate that the top speed is scarcely affected in spite of the greater gross weight. It is thought that the climb is slightly improved, due, probably, to the better arrangement of the wing on top of the fuselage resulting in less interference drag. The take-off of the new "Roland" is better than that of the older type, and the D.V.L. has granted the machine a C. of A. for a greater gross weight, *i.e.*, 7,600 kg. (16,522 lb.) instead of 7,400 kg. (16,270 lb.).

The useful load has been slightly reduced, owing to the greater tare weight of the new type, but it is thought that the users will readily accept this as the price paid for greater comfort for passengers and cheaper maintenance cost. The actual performance figures will be published as soon as they have been certified by the D.V.L.

THE ROYAL AIR FORCE

London Gazette, May 14, 1929

General Duties Branch

G. F. Humphries is granted a short-service commn. as Pilot Officer on probation, with effect from and with seniority of May 1; Flying Officer D. G. P. FitzPatrick takes rank and precedence as if his appointment as Flying Officer bore date April 4, reduction takes effect from April 12; Flight-Lieut. I. M. Rodney is placed on half-pay list, scale B, from May 16 to August 15, inclusive; Wing Commander S. Grant-Dalton, D.S.O., A.F.C., is placed on retired list at his own request (May 6).

The following are transferred to the Reserve, Class A:—Flight-Lieut. H. S. Dawe (May 6); Flying Officer H. M. Schofield (May 14). Pilot Officer on probation J. A. Lawson (Lieut., A.I.R.O.) resigns his short-service commn. (April 20); Flying Officer C. H. Roberts (Lieut., A. and S. Highrs., R.A.R.O.) relinquishes his short-service commn. on account of ill-health (May 9). The following Lieuts., R.N., Flying Officers, R.A.F., relinquish their temporary commns. on return to Naval duty:—S. C. Tuke (Feb. 27); N. R. Courthope-Munroe (March 12). The following relinquish their temporary commns. on return to Army duty (May 12):—Flying Officer F. S. S. Lamprey (Lt., The Green Howards); Flying Officer (Hon. Flight Lieut.) D. J. Stewart (Capt. Y. and L. Regt.).

Medical Branch

Flying Officer R. E. Alderson, M.B., ceases to be seconded to Royal Victoria Infirmary, Newcastle-upon-Tyne (May 1).

Memorandum

The permission granted to Sec.-Lieut. C. G. D. Airey to retain his rank is withdrawn on his enlistment in Supplementary Reserve (April 19).

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

H. C. W. Brewer is granted a commn. in Class AA (ii.) as Pilot Officer on probation (April 29); Pilot Officer H. Haigh is promoted to rank of Flying Officer (May 8); Flight-Lieut. H. L. Nunn, D.S.C., D.F.C., is transferred from Class C to Class A (April 8).

The following Flying Officers are transferred from Class A to Class C:—W. J. Umpleby (Jan. 5); J. E. Doran-Webb (March 15). Flying Officer E. F. Smith is transferred from Class AA to Class C (May 14); Pilot Officer R. C. C. Gale is transferred from Class AA (ii.) to Class C (May 14). Pilot Officer G. F. Humphries relinquishes his commn. in Special Reserve on appointment to a short-service commn. in Royal Air Force (May 1).

AUXILIARY AIR FORCE

General Duties Branch

No. 601 County of London (Bombing) Squadron.—The following to be Pilot Officer:—T. L. E. B. Guinness (March 31); Pilot Officer S. A. Morse resigns his commission (May 14).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Wing Commander G. B. Dacre, D.S.O., to H.Q., Coastal Area, Supernumerary; 15.4.29.

Squadron-Leaders: G. H. P. Padley, to H.Q., Wessex Bombing Area, Andover for Engineer Duties; 29.4.29. H. S. Kerby, D.S.C., A.F.C., to R.A.F. Depot, Uxbridge; 6.4.29.

Flight-Lieutenants: P. J. A. Hume-Wright, to No. 12 Sqdn., Andover; 24.4.29. A. G. Jarvis, A.F.C., to No. 26 Sqdn., Catterick; 4.5.29. E. A. McKinley-Hay, to No. 1 Flying Training Sch., Netheravon; 1.5.29. K. A. Meek, M.B.E., to Aeroplane and Armament Experimental Estab., Martlesham Heath; 6.5.29. J. J. Teasdale, to Central Flying Sch., Wittering; 1.5.29. H. T. Herring, to H.Q., Wessex Bombing Area, Andover; 26.4.29. E. D. Barnes, to No. 22 Sqdn., Martlesham Heath; 9.3.29, instead of Aeroplane and Armament Experimental Estab., as previously stated; R. J. Sanceau, to Central Flying Sch., Wittering; 3.4.29. H. G. Sawyer, A.F.C., to R.A.F. Depot, Uxbridge; 28.3.29. W. L. Payne, to No. 8 Sqdn., Aden; 15.4.29. S. D. Scott, to R.A.F. Depot, Uxbridge; 5.4.29. P. Warburton, M.B.E., to H.Q., Iraq; 11.4.29, instead of 5.4.29 as previously stated.

Flying Officers: F. L. Kingham, to H.Q., Air Defence of Gt. Britain; 7.5.29; (Hon. Flight-Lieut.) U. C. de Burgh, to No. 1 Sch. of Tech. Training, Halton; 3.5.29. R. H. Holmes, to R.A.F. Depot, Uxbridge; 6.4.29. R. R. Bennett, to R.A.F. Depot, Uxbridge; 9.4.29.

Pilot Officer: R. R. R. J. Holmes, to No. 5 Flying Training Sch., Sealand; 30.4.29. J. C. Allan, to No. 101 Sqdn., Bircham Newton; 15.5.29. R. C. I. Pearse, to No. 100 Sqdn., Bicester; 16.5.29.

Stores Branch

The following flying officers and pilot officers are all posted to Home Aircraft Depot, Henlow, to complete course of instruction in Stores duties, with effect from April 22, 1929:—*Flying Officers:* R. B. Fleming, C. H. W. Boldero, A. E. Haes, and J. T. Riggs. *Pilot Officers:* V. H. B. Roth, M. H. Robinson, A. J. Howell, W. J. B. Elliott, J. E. V. Tyzack, R. G. Seymour, R. C. Storrar, G. Blinman, and H. H. Hilliar.

Flight-Lieut. H. B. S. Ballantyne, to No. 45 Sqdn., Middle East; 23.4.29.

Accountant Branch

Flight-Lieut. C. W. Price, to Station H.Q., Cattewater; 1.5.29.

Flying Officers: R. S. Sweet, to No. 26 Sqdn., Catterick; 6.5.29. J. E. Gregson, to Station H.Q., Andover; 1.4.29.

Medical Branch

Flight-Lieut. A. P. McClare, to R.A.F. Depot, Uxbridge, for duty as Dental Officer; 24.4.29.

Flying Officers: J. L. Groom, to R.A.F. Training Base, Leuchars; 30.4.29. R. E. Alderson, M.B., to Medical Training Depot, Halton; 1.5.29.

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CORRESPONDENCE

[The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.]

GETTING OFF IN A CALM

[2192] With reference to the interesting article in your issue of May 9, p. 382, has Sqd.-Ldr. Scott tried air lubrication?

I found our normal run of 60 to 70 yards before "unsticking" could be reduced by air lubrication to 30 to 40 yards when there was no wind.

This might not be so with big weights and high speeds. I was dealing with speeds under 30 m.p.h. and weights well under four figures all up.

E. W. Wakefield,
Kendal, May 13, 1929 Late Lakes Flying Co.

THE FIRST SPIN

[2193] In reply to your correspondent's letter with reference to the first spinning, deliberately carried out *with success*, I should like to state that the late Major F. W. Gooden carried out a series of experiments on a FE 8, spinning the machine both ways three times and then wrote a report on spinning and how to do it which was circulated throughout the service.

It may be recalled that at this time, approximately May, 1916, several fatal accidents happened on this type and a similar type of machine.

The experiment was done at Farnborough, where Dr. Lindeman was also employed in scientific research, but he had not at that time learnt to fly.

Your correspondent will no doubt notice an interesting similarity in the names. L. R. Tait Cox

London Aerodrome, May 14, 1929.

THEORY OF LONG-DISTANCE FLIGHT

[2194] In his article on the theory of long-distance flight in the April number of the Aircraft Engineer, Mr. Nebesar has approached the problem of long-distance flying in a very original and interesting way. Does he not, however, overstress the need for flying at the attitude of minimum drag? He appears to take it for granted that an aeroplane with a high aspect ratio must fly slowly because the speed at which minimum drag is obtained is lower than it would be if a low aspect ratio were used.

In the case of machines which are within normal proportions, it is usually true that those of high aspect ratio will fly with less power, at the same speed, than those which are of low aspect ratio but otherwise similar.

Some caution would be advisable in the application of Mr. Nebesar's theory, for while he admits that "β" is a variable quantity, he nevertheless assumes it to be constant when he differentiates the expression for drag so as to find its minimum values and the speed at which it occurs. In practice this would lead to serious error both in resistance and speed.

In any case, even if the minimum resistance did occur when the induced resistance coefficient was equal to the sum of the profile and parasite resistance coefficients, would it not be better to reduce the parasite resistance rather than increase the induced resistance in order to obtain that condition? G. Machray.

London, May 17, 1929.

AIR POST STAMPS

By DOUGLAS ARMSTRONG
(*Editor of "The Stamp Collector"*)

Alcock Memorial Stamp

ALTHOUGH not strictly speaking an air post stamp, the 15 cents value of the recent Newfoundland series has a special interest for air post collectors, in that the design shows the Vickers-Vimy aeroplane, in which Sir John Alcock carried the first air mail across the Atlantic in June, 1919, taking off from Lester's field, St. John's, for the epoch-marking flight. Beneath the very effective vignette appear the words, "First Aeroplane to cross the Atlantic (non-stop) leaving St. John's, 1919."

Incidentally, the various types of aircraft illustrated upon the world's air post stamps would make a most fascinating study for any enthusiast who was minded to attempt their classification. That appearing upon the Bulgarian issue is patently intended for a Junker model, while the Cuban variety is as obviously an Aeromarine seaplane. Some of these philatelic aircraft are doubtless of a kind that never was on land or sea, but most of the standard machines will be found to be represented in the air post collector's album.

London-Orient Flight Stamps

Interesting mementoes of the successful flight by the British supermarine flying-boats from London to Singapore are to be found in the form of a special issue of Philippines postage stamps for use upon a small mail conveyed by Capt. Cave-Browne-Cave's flotilla between Manila and Hong Kong on the last stage of the tour on November 18 last. The object of the experiment was to test the practicability of a regular air mail service over the same route and only two small bags containing approximately 500 letters in all were carried. These were prepaid by means of contemporary postage stamps of the Philippines expressly overprinted in red with an aeroplane device, together with the initials "L.O.F." (signifying London-Orient Flight) and the date "1928." Although of the lowest value, 2 cents, as many as 101,200 copies were thus treated for the occasion there were but 6,000 of the 1 peso, which should make complete sets of eleven denominations desirable property for air post enthusiasts.

Dutch Indies Air Stamps

The opening up of air lines both between Holland and the Dutch Indies and certain towns in the archipelago itself has already given rise to two distinct issues of air post stamps in this part of the globe, the first of which is now obsolete and rapidly rising in value. Pending receipt of a set of air post stamps of definitive design on order from the government stamp printers at Haarlem, a quantity of current postage stamps of the Netherlands Indies was locally overprinted with the figure of an aeroplane surmounted by the word "Luchtpost" for provisional use on or about September 20, 1928. Of the lower values the total printing amounted to as much as one million copies, but in the case of the 1·50 gulden no more than 85,000 were issued. The provisional stamps were employed for both local and external air postage until about the middle of November, when a curious, but permanent series made its debut in an impressionist design by Mr. Fokko Mees depicting a Menanka House, flanked by a Bali Temple with a volcano and Javanese tower in the foreground and three monoplanes flying over all. The denominations are the same as those of the overprinted set, viz., 10 cents purple, 20c. brown, 40 c. carmine, 75c. green and 1·50 gulden orange.

R.AE.S. AND INST.AE.E.

Official Notices

Conversazione.—During the International Aircraft Exhibition a conversazione will be held in the Science Museum at South Kensington by kind permission of Colonel Sir Henry Lyons. The date chosen, July 25, is the twentieth anniversary of Bleriot's flight across the English Channel. It is hoped that the historic machine in which the flight was made will be on view in the Aeronautics Section.

The Wilbur Wright Memorial Lecture will be delivered during the evening by Hon. Wm. MacCracken, Jnr., Assistant Secretary of State for Commerce of the National Advisory Committee for Aeronautics of the United States of America.

J. LAURENCE PRITCHARD, *Secretary.*

PERSONALS

To be Married

The engagement is announced between TERENCE HOWARD CARR, R.A.F., elder son of Maj.-Gen. Howard Carr, C.B., and Mrs. Carr, of Netley Abbey, and MARY, younger daughter of the late P.F. MACKENZIE-RICHARDS, M.I.C.E, and Mrs. Mackenzie-Richards, Yeldham, Essex.

The engagement is announced between Mr. LORNE CURRIE, R.A.F., youngest son of the late Mr. J. M. Currie and of Mrs. Currie, of Springfield House, Honiton, Devon, and Miss OLIVE MARY OMMANNEY, elder daughter of Mr. and Mrs. Francis F. Ommanney, of Dirks, Alston, Devon.

The marriage arranged between Mr. ARTHUR FRANK GARTON-OVENDEN, late R.A.F., and the Hon. NEA ROBINSON will take place on Thursday, June 6, at 2.15 p.m. at St. James's, Piccadilly.

The engagement is announced between WING-COMM. EDYE ROLLESTON MANNING, D.S.O., M.C., R.A.F., son of the late William Alexander Manning, of Sydney, N.S.W., and PHYLLIS MARY LOUISE, daughter of Mr. and Mrs. CLARENCE A. DEGENHARDT, of Killara, Sydney, N.S.W., Australia.

Death

FLIGHT.-LIEUT. EDWARD RODOLPH CLEMENTS SCHOLEFIELD, A.F.C., D.C.M., of Silsol, Devonshire Road, Weybridge, who died on May 16, at Shepperton, as the result of a flying accident, was chief test pilot for Vickers, Aviation, Ltd. His age was 35. He served in the Royal Flying Corps during the war, and was shot down while on patrol duty and taken prisoner. After the war he became an experimental test plot at the Royal Aircraft Establishment. He leaves a widow and one child.

Gordon Shephard Memorial Prize Essay Awards

THE Air Ministry announces:—The Gordon Shephard Memorial Prizes, which are given annually for the best essays submitted by members of the Royal Air Force on subjects selected by the Air Council, have been awarded as follows in the 1928 competition:—First Prize, Sqdn.-Ldr. G. C. Pirie, M.C., D.F.C., p.s.a. 2nd Prize, Group-Capt. E. D. M. Robertson, D.F.C. The competition was established as a memorial to the late Brigadier-General G. S. Shephard, D.S.O., M.C., Royal Air Force.

PUBLICATIONS RECEIVED

Aeronautical Research Committee Reports and Memoranda: *No.* 1165 (*Ae.* 329).—Wind Tunnel Experiments on the Design of an Automatic Slot for R.A.F. 28 Section, and on Interconnection with Ailerons. By F. B. Bradfield and K. W. Clark. April, 1928. Price 1*s.* net. *No.* 1173 (*Ae.* 337).—Full Scale Determination of the Effect of High Tip Speeds on the Performance of an Airscrew. By W. G. Jennings. August, 1928. Price 9*d.* net. *No.* 1181 (*Ae.* 345).—Instrumental Records of the Lateral Motions of a Stalled Bristol Fighter Aeroplane. By Prof. B. Melvill Jones and Flight-Lieut. C. E. Maitland. September, 1928. Price 1*s.* net. *No.* 1186 (*Ae.* 348).—Wind Tunnel Tests of Various Servo Rudder Systems. By K. V. Wright. March, 1928. Price 1*s.* net. *No.* 1192 (*Ae.* 354).—Wind Tunnel Tests for Design of an Automatic Slot for Avro 504 N. By E. T. Jones and K. W. Clarke. May, 1928. Price 9*d.* net. *No.* 1193 (*Ae.* 355).—The Longitudinal Control of an Aeroplane Beyond the Stall. By H. M. Garner and K. V. Wright. May, 1928. Price 4*d.* net. *No.* 1198 (*Ae.* 359).—Wind Tunnel Tests with High Tip Speed Airscrews. The Characteristics of a Conventional Airscrew Section, 0·082c. Thick, and of R.A.F. 27 and R.A.F.28. By G. P. Douglas and W. G. A. Perring. May, 1928. Price 1*s.* net. *No.* 1202 (*Ae.* 363).—Determination of the Twist of a Wing of an Aeroplane in Flight. By W. G. Jennings. September, 1928. Price 6*d.* net. H.M. Stationery Office, Kingsway, London, W.C.2.

AERONAUTICAL PATENT SPECIFICATIONS

(*Abbreviations:* Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

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Published May 23, 1929

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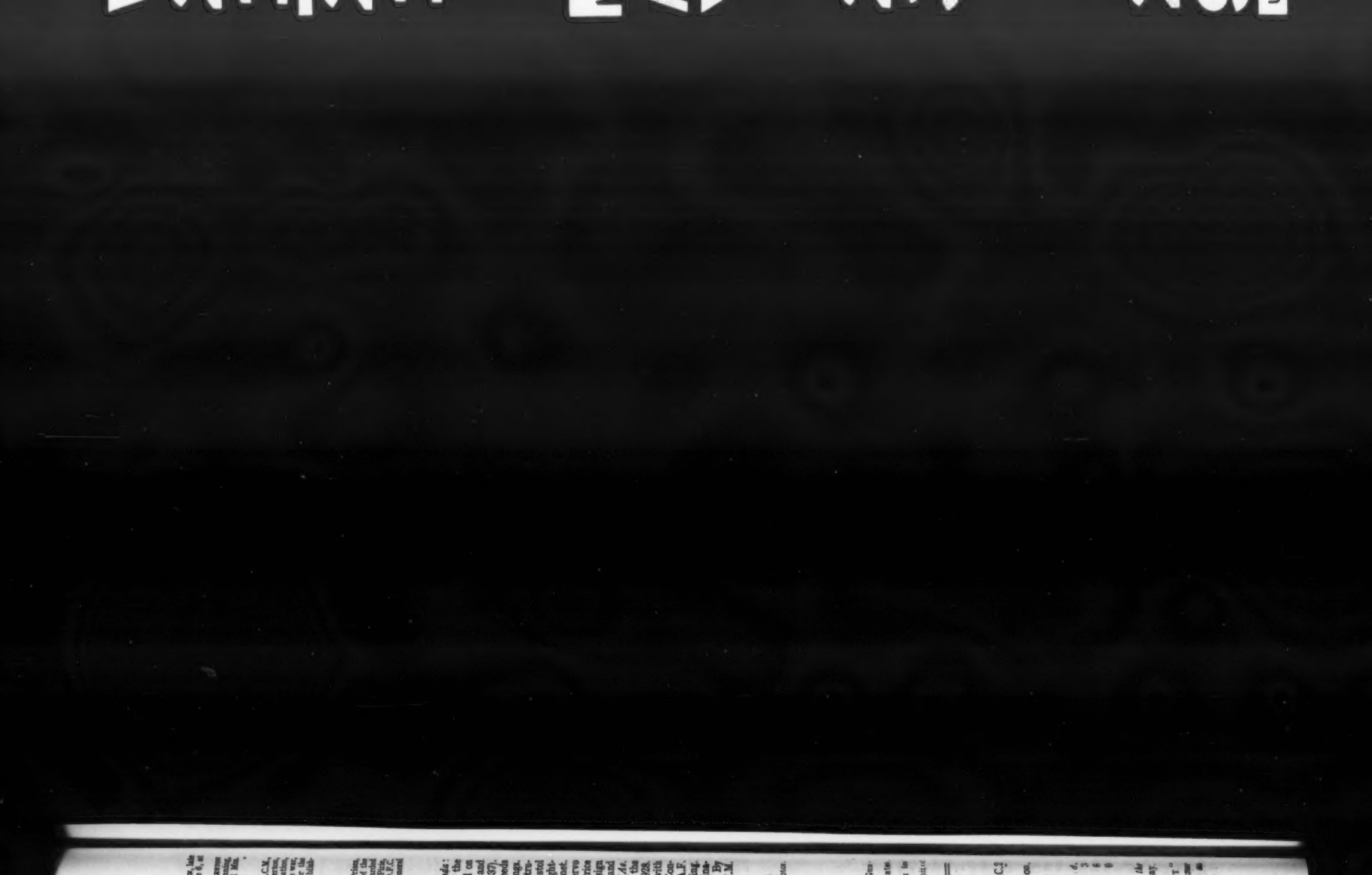
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